

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

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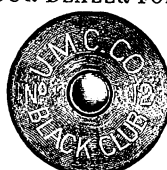


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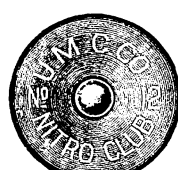
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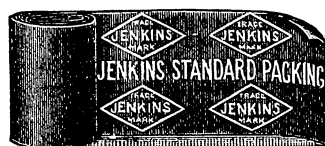
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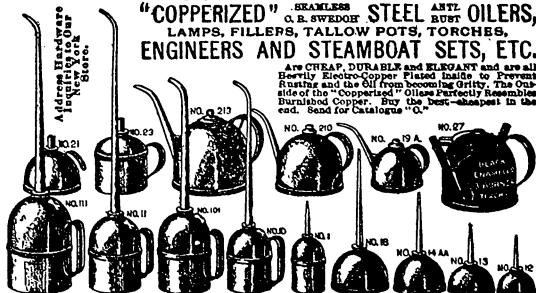
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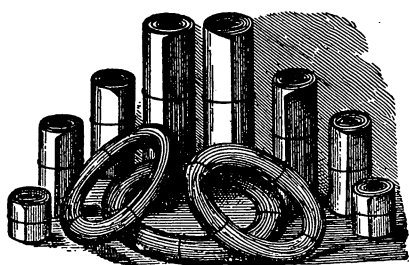
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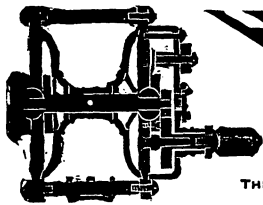
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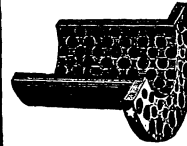
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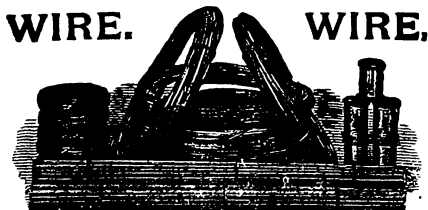
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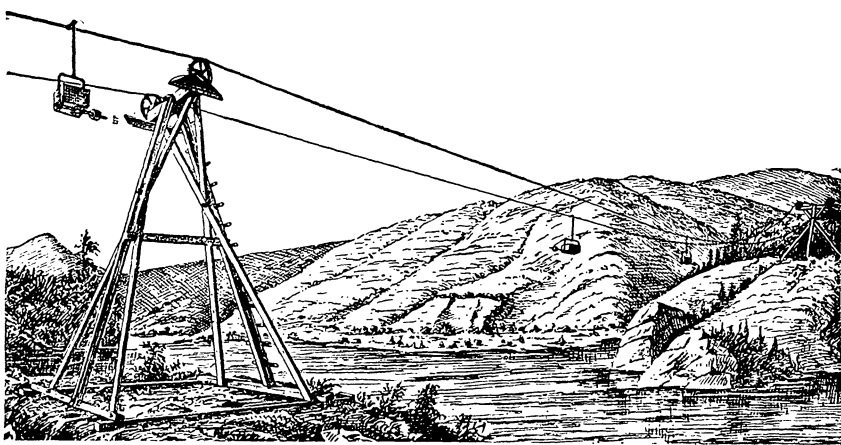
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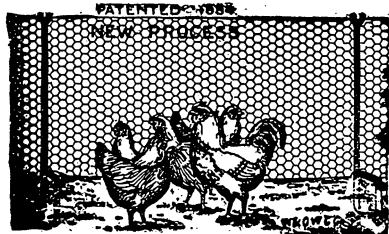
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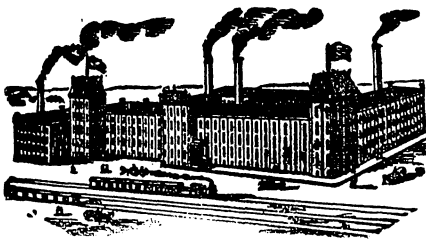
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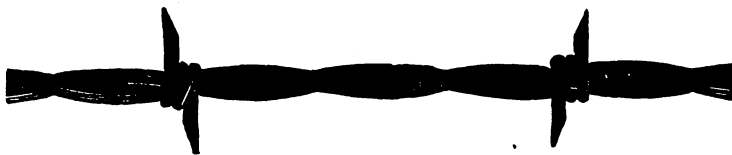
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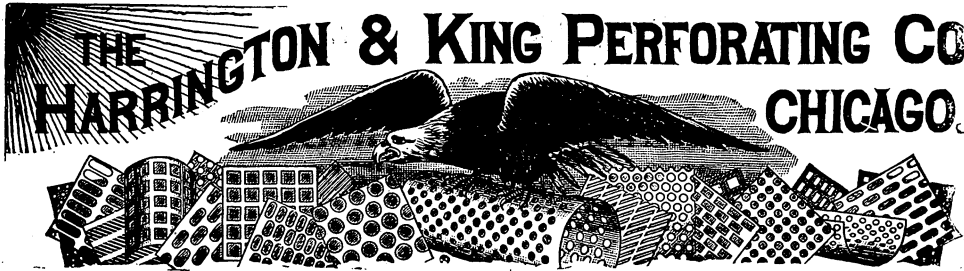
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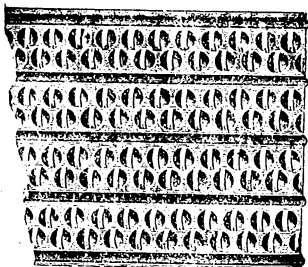
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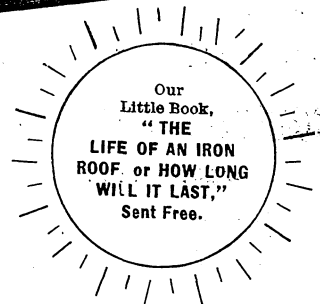
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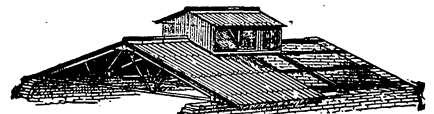
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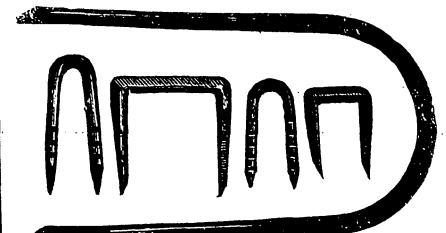


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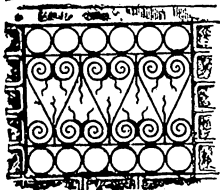
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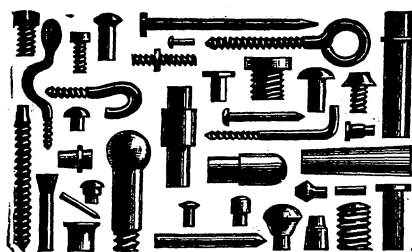


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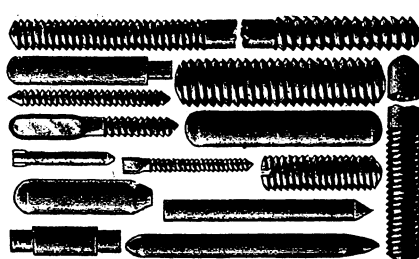
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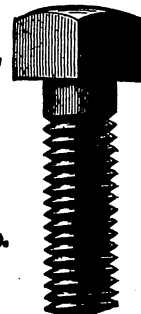
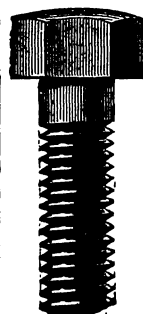
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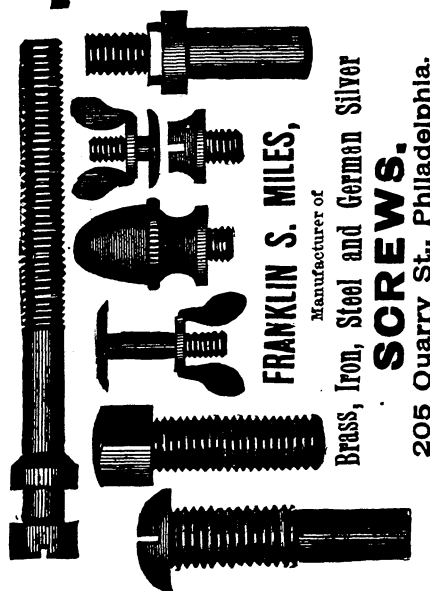
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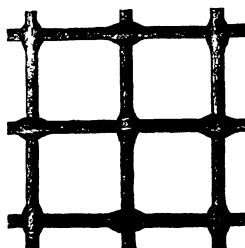
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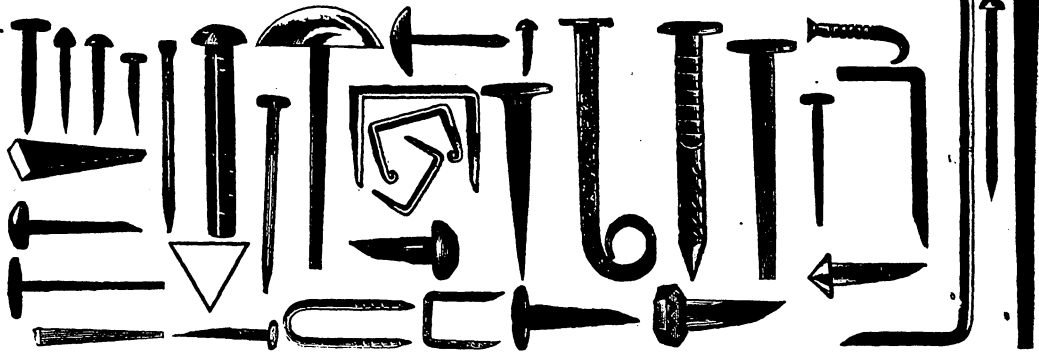
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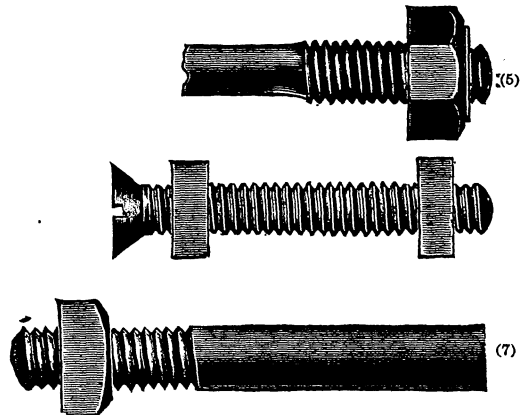


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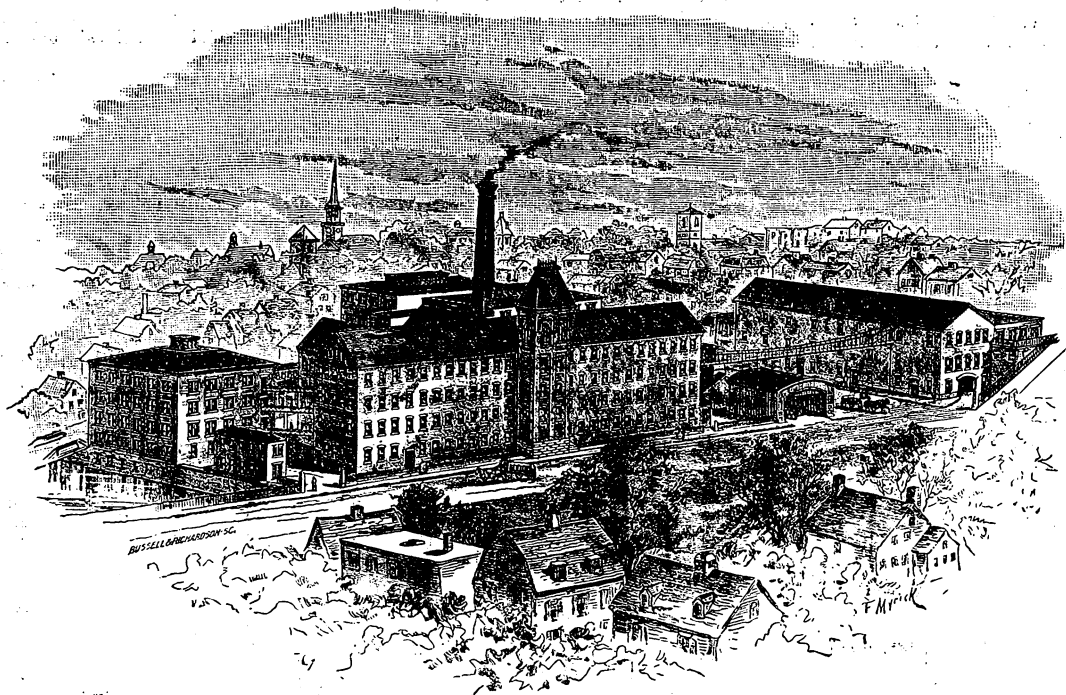
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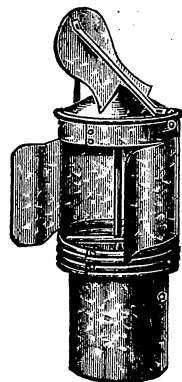
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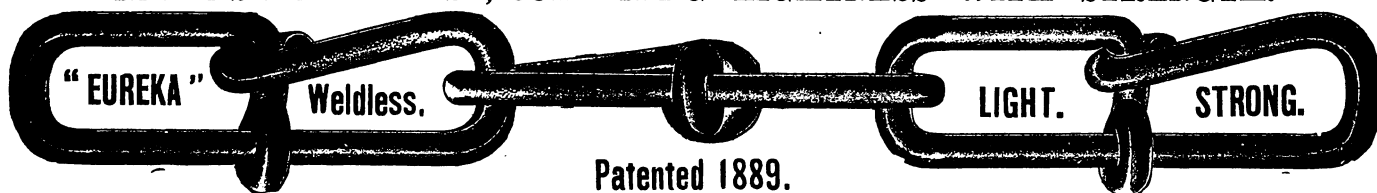
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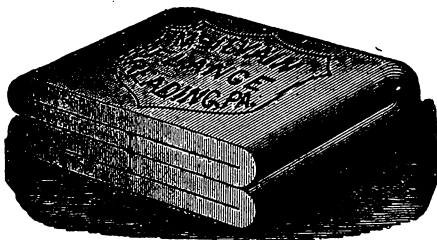
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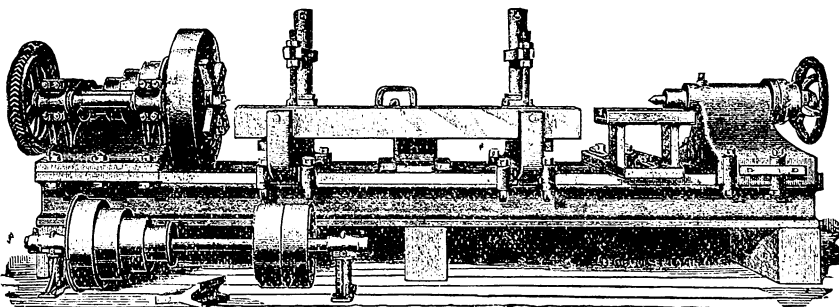
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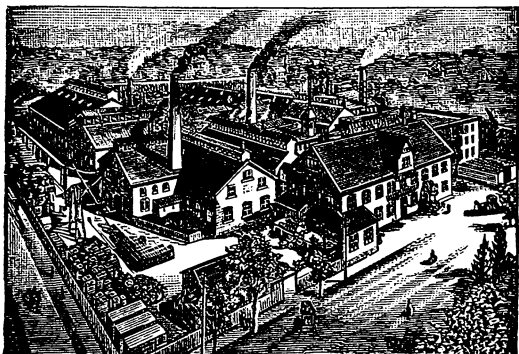
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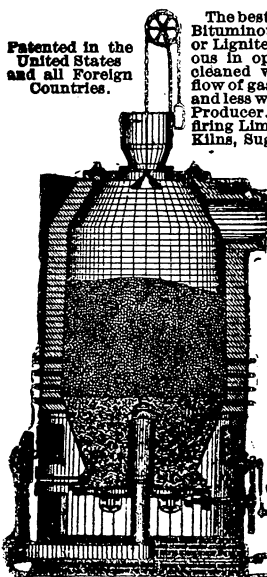
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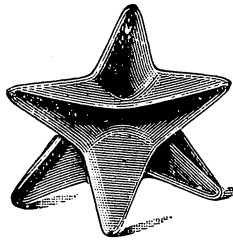
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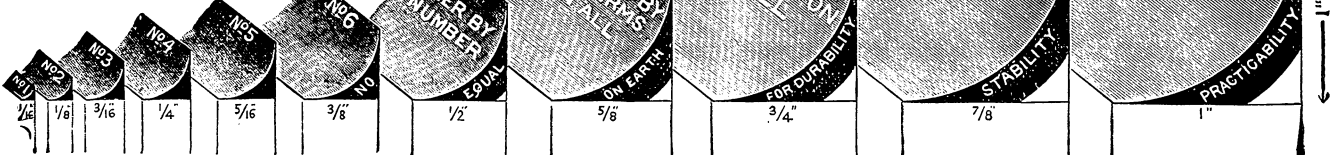
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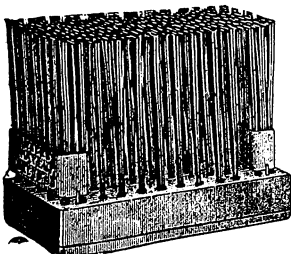
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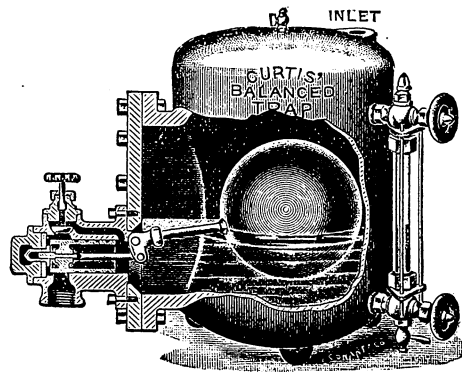
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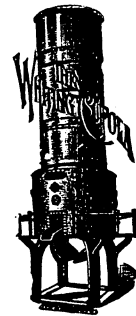
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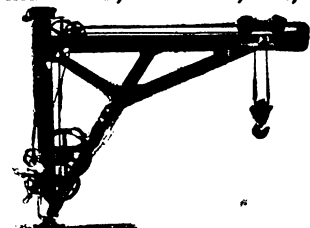
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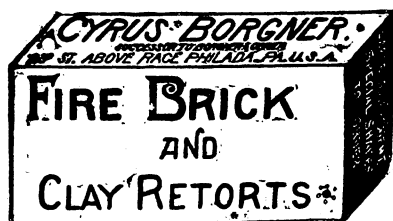
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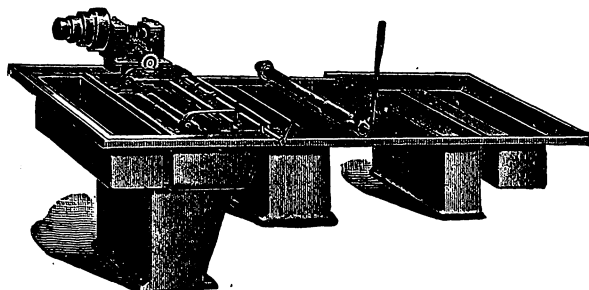
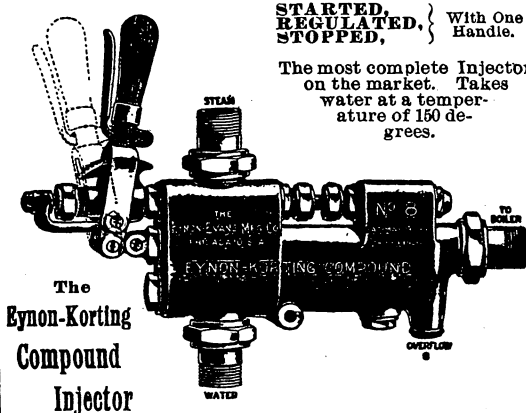
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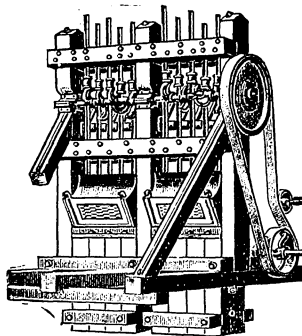
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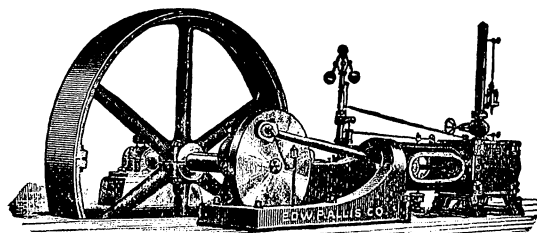
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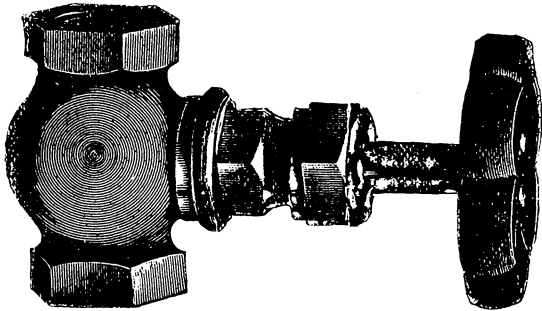
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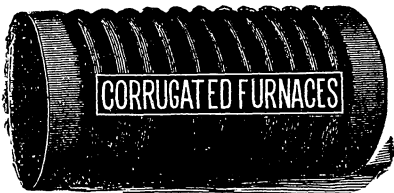
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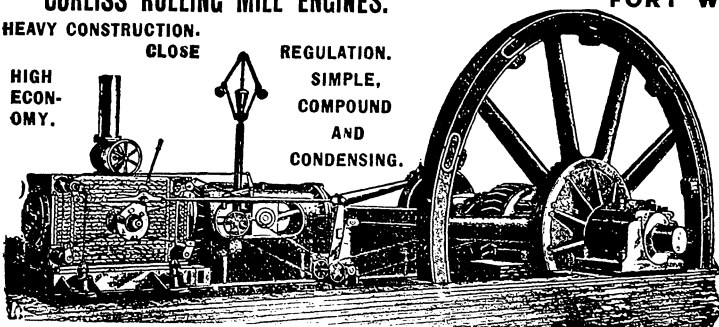
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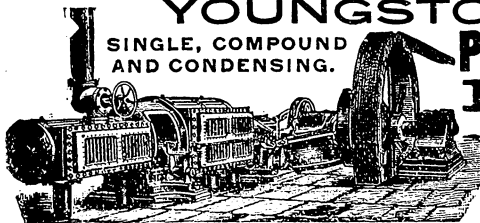
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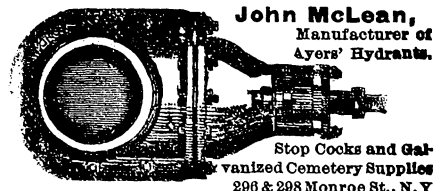
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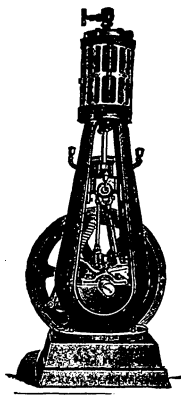
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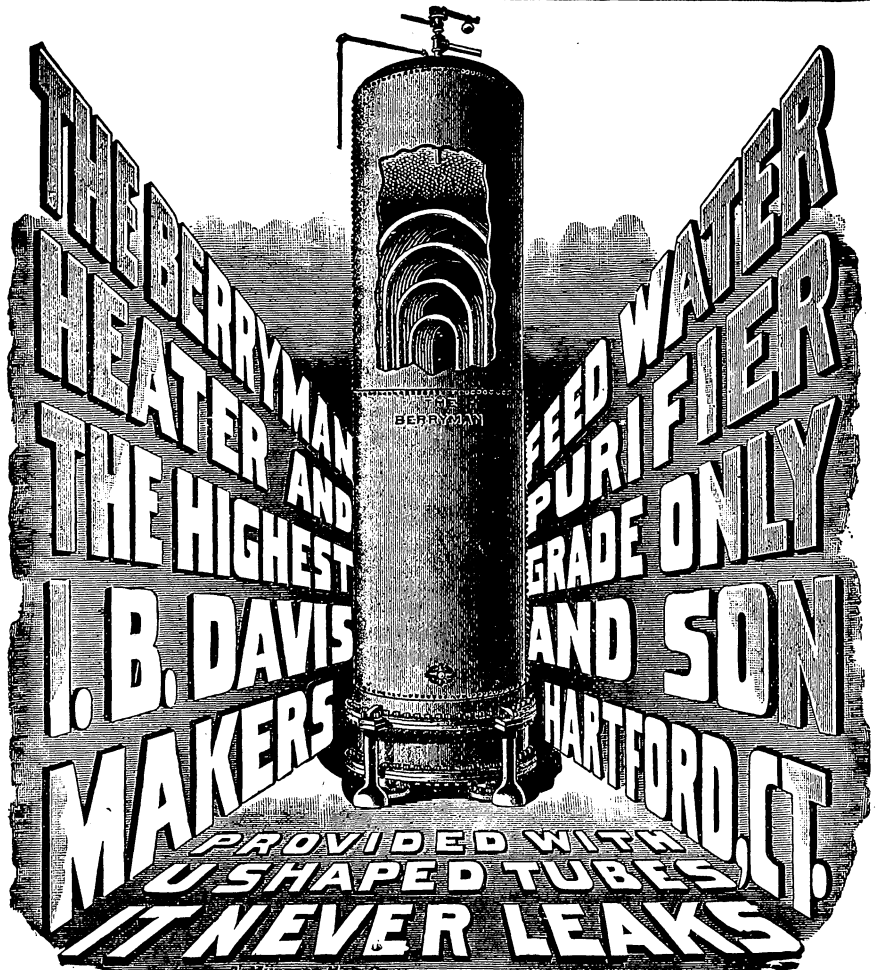
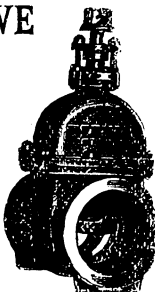
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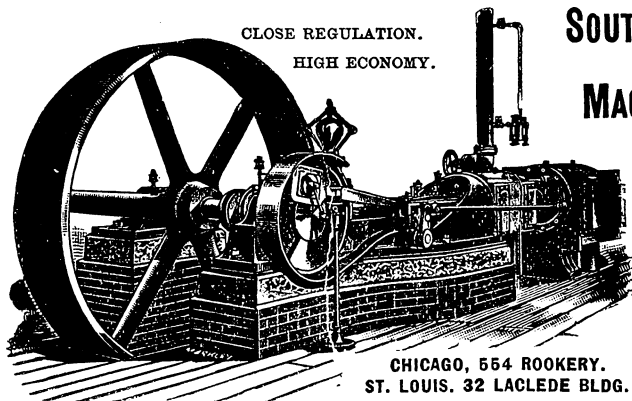


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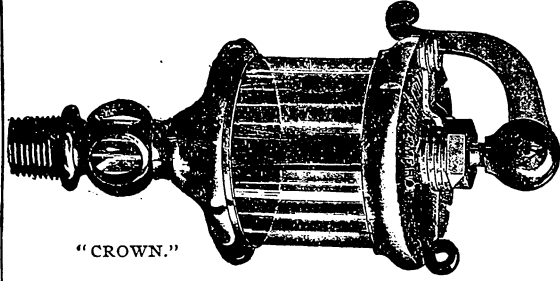
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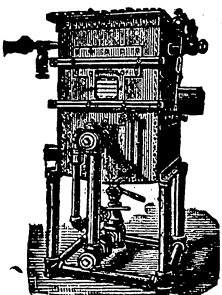
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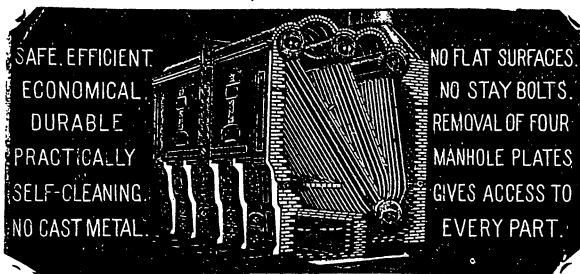
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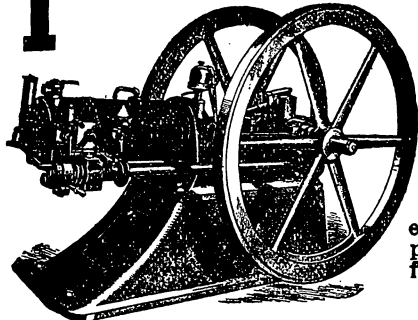


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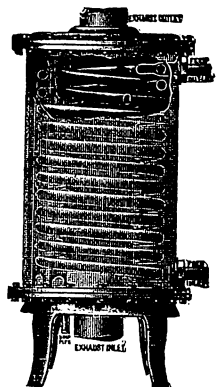
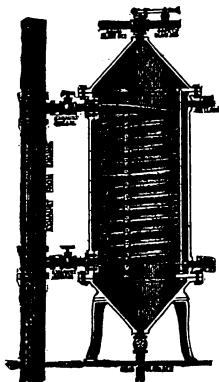
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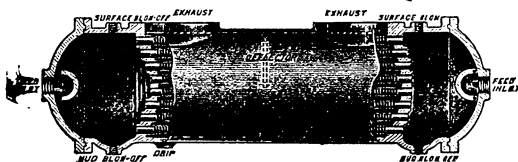
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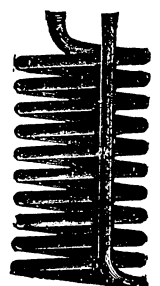
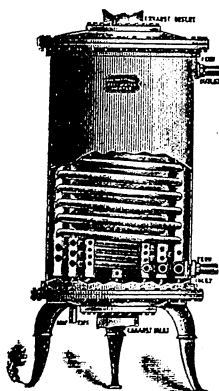
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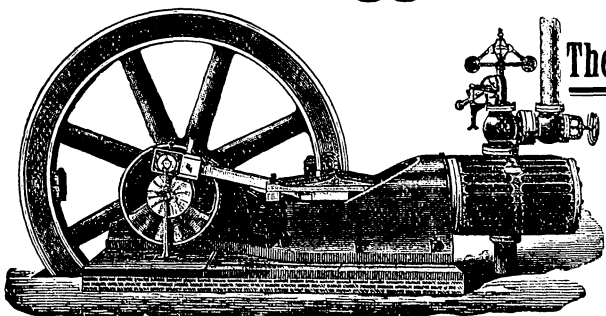
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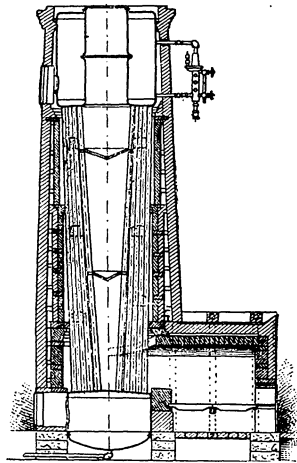
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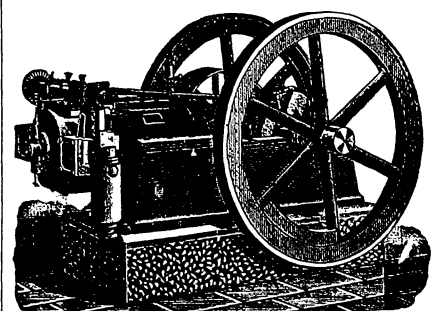
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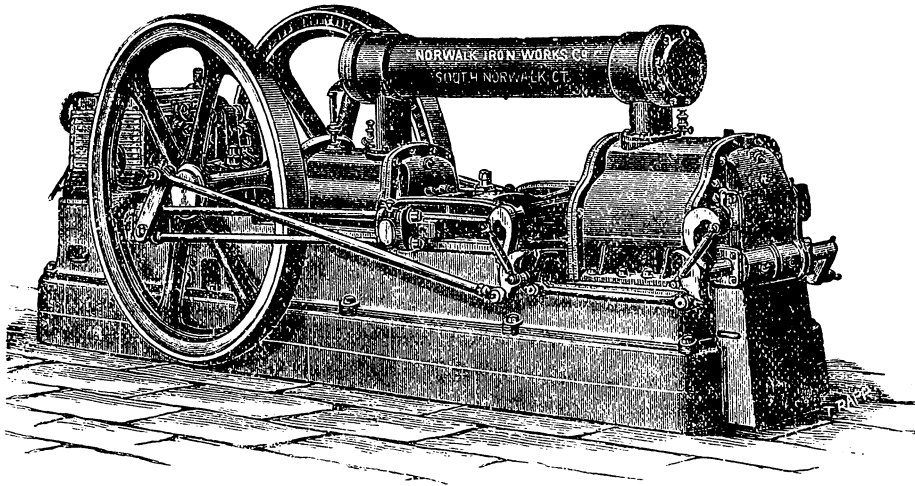


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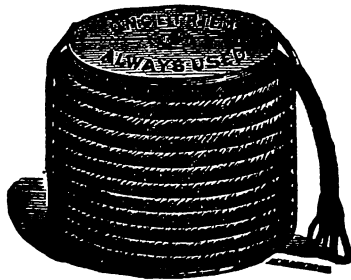
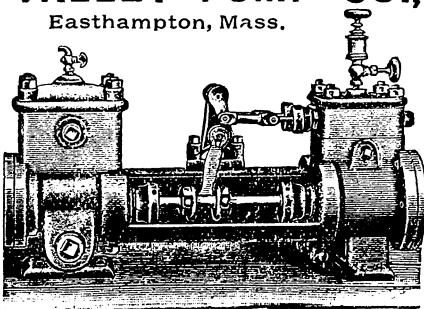


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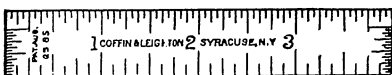
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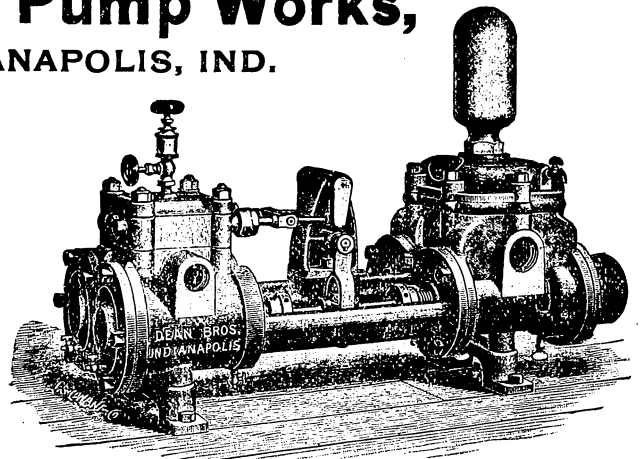
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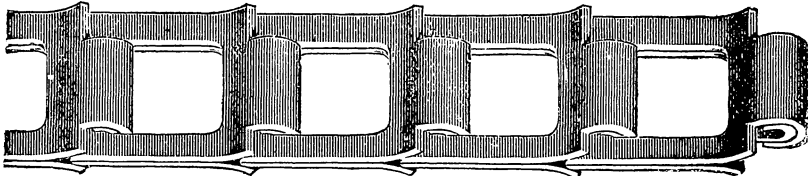
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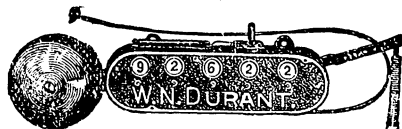
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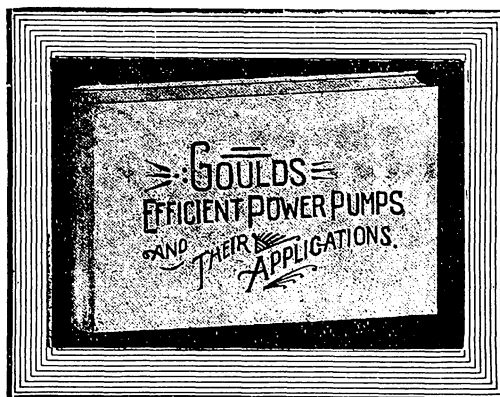
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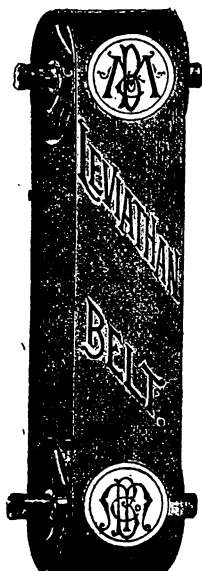
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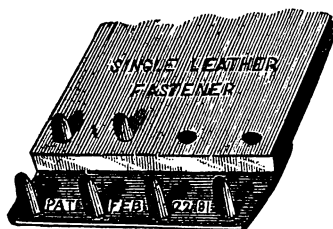
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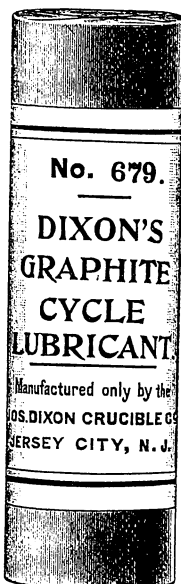
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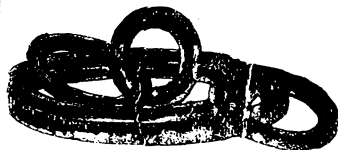
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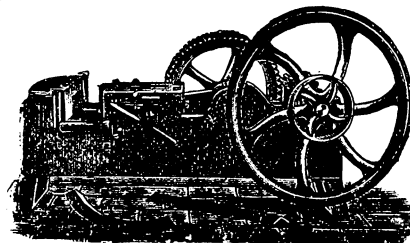
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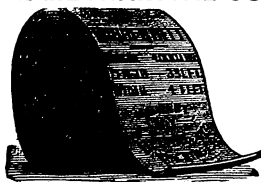
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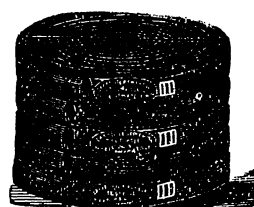


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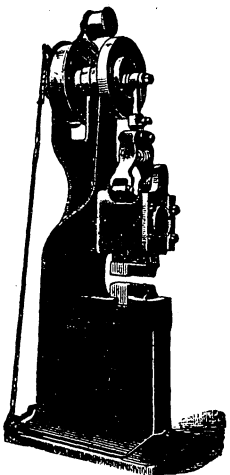
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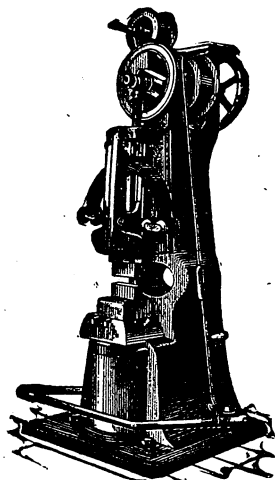
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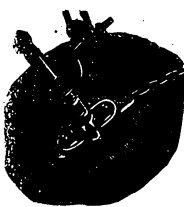
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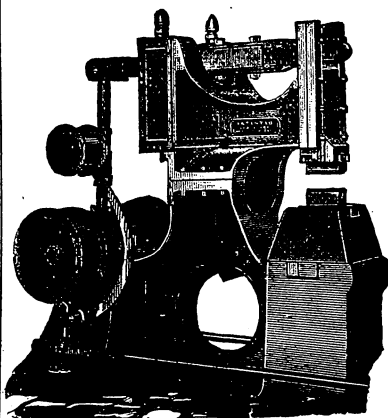
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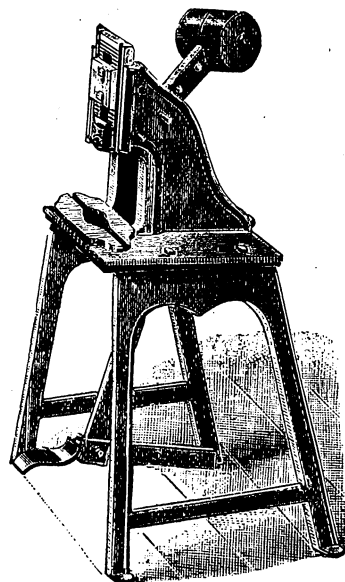
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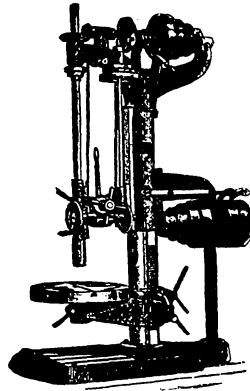
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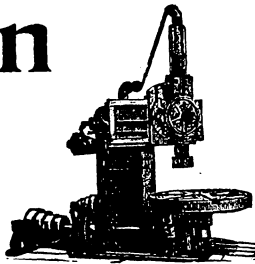
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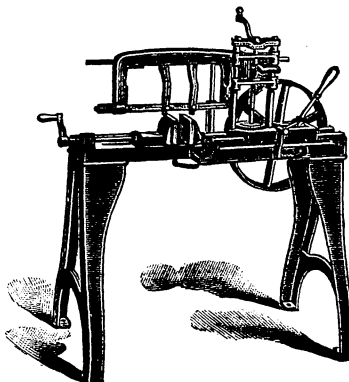


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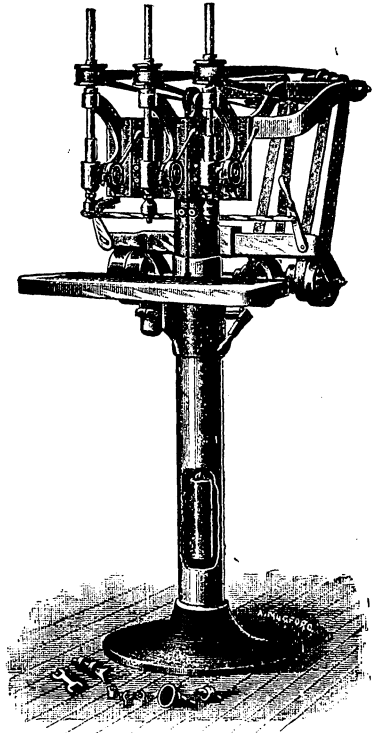
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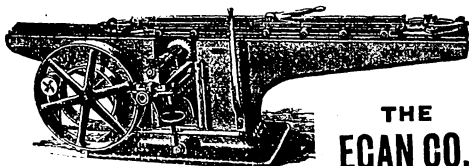
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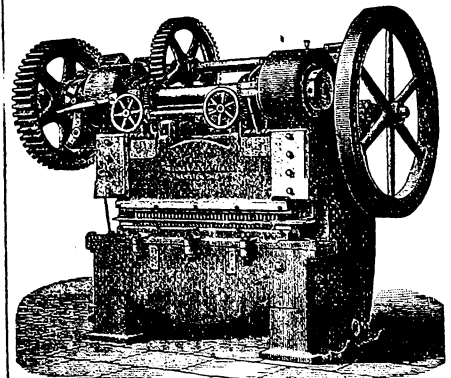
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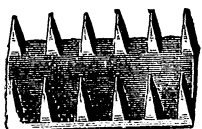


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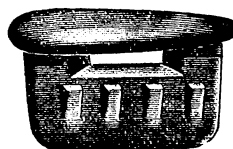
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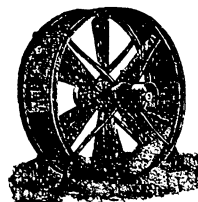
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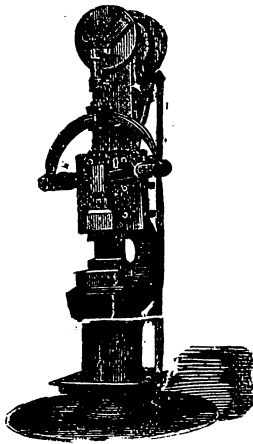


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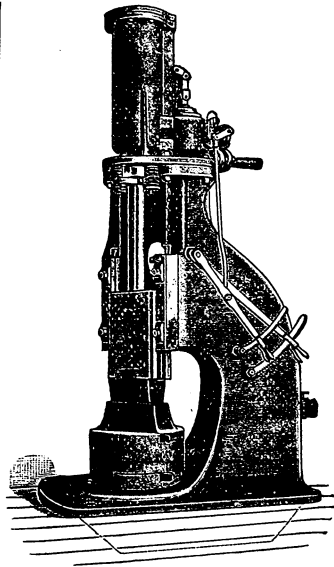
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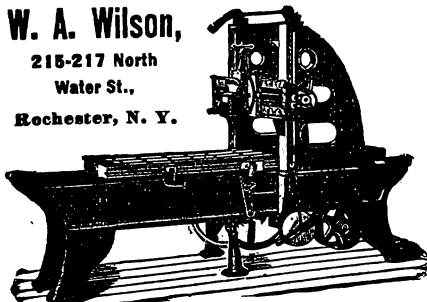
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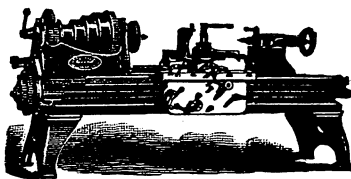
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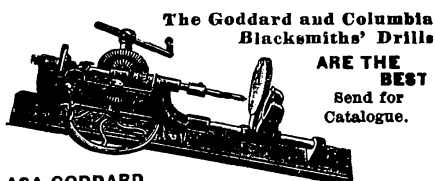
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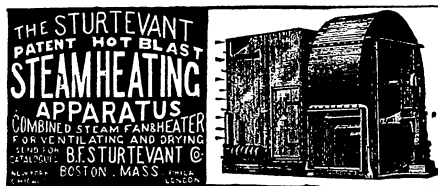
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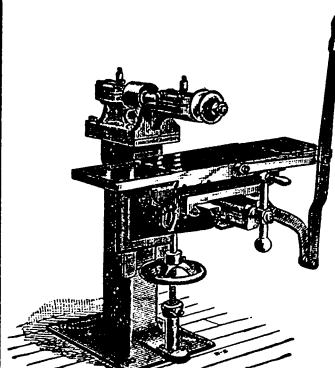
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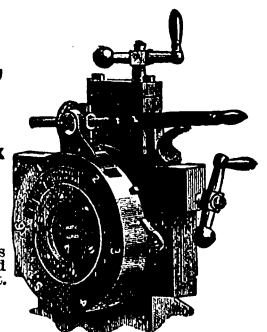
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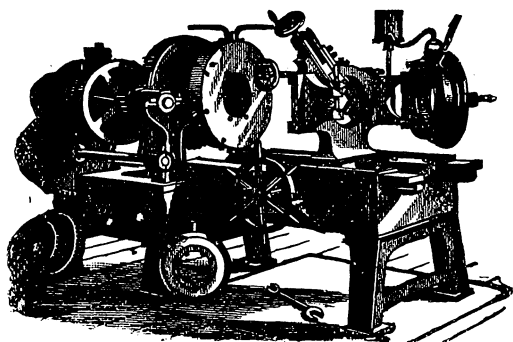
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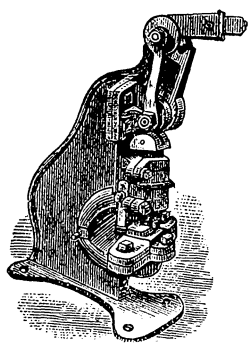
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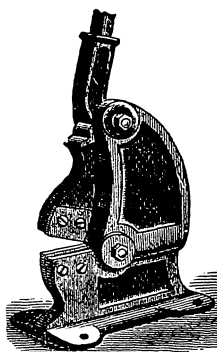
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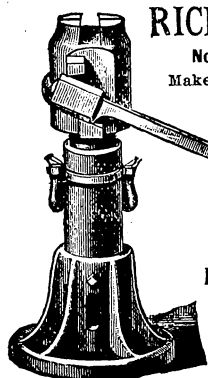
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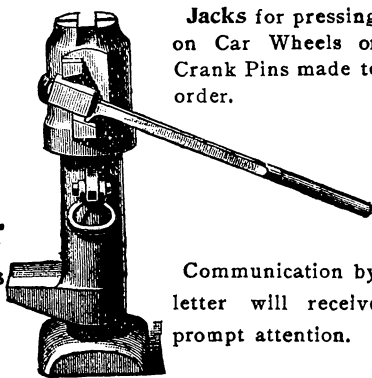
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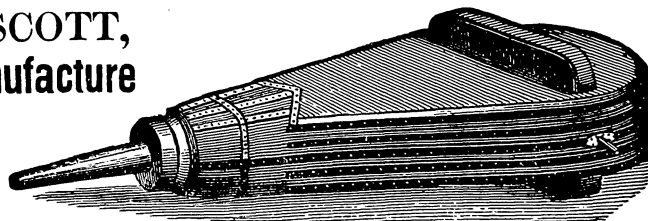


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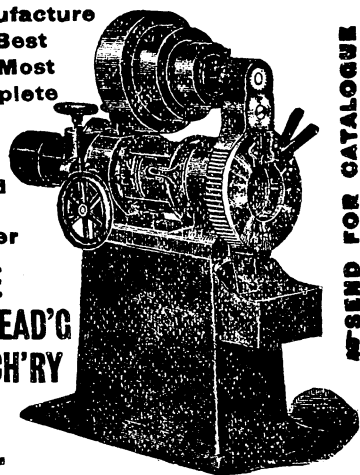


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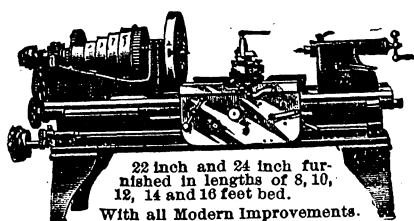
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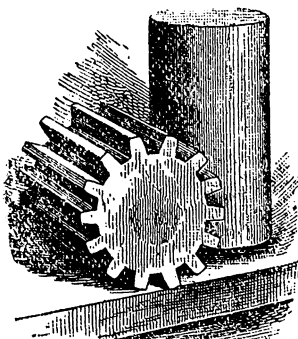
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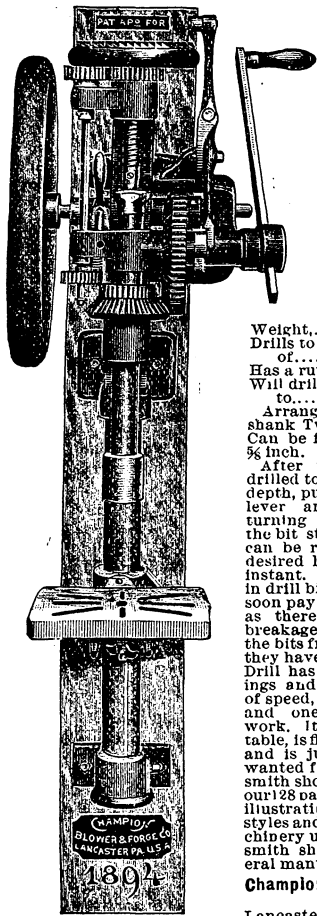
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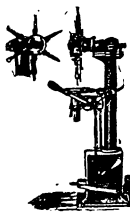
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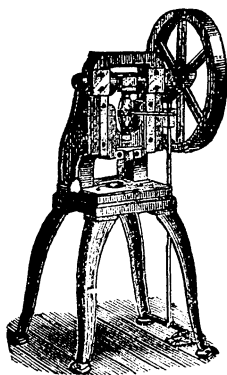
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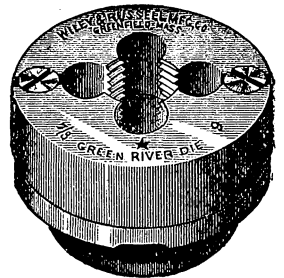
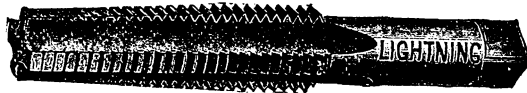
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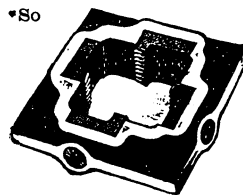
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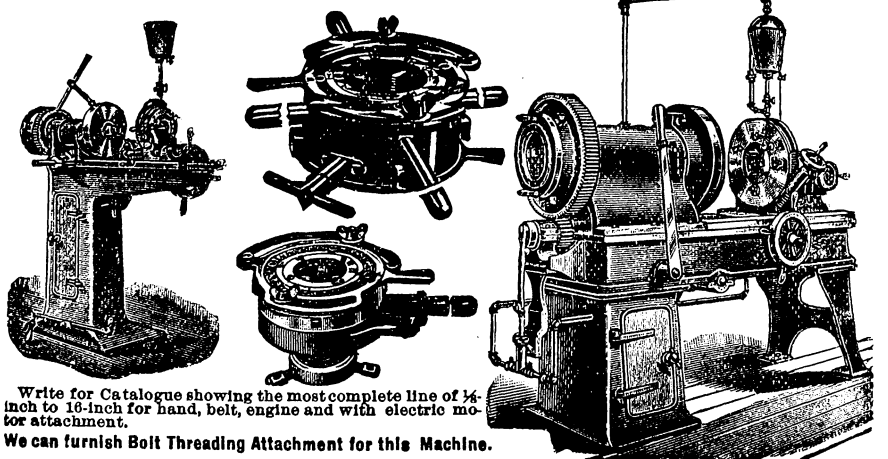
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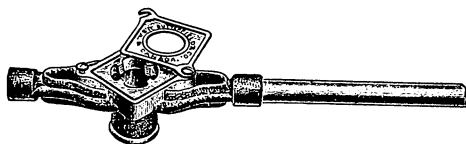
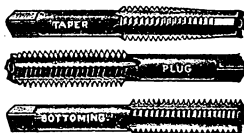
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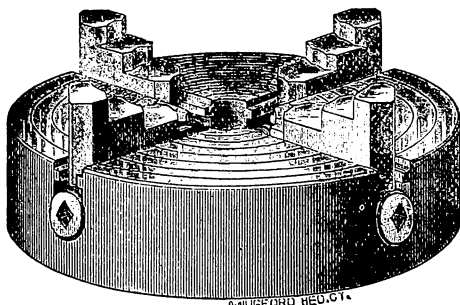


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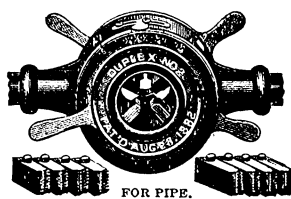
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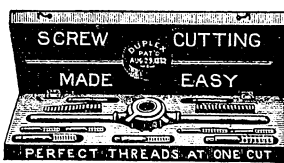
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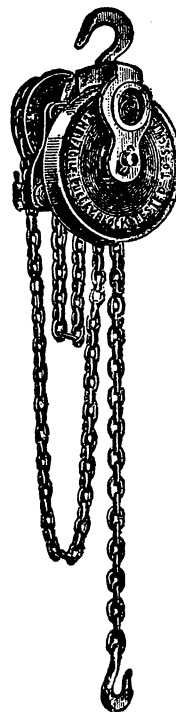
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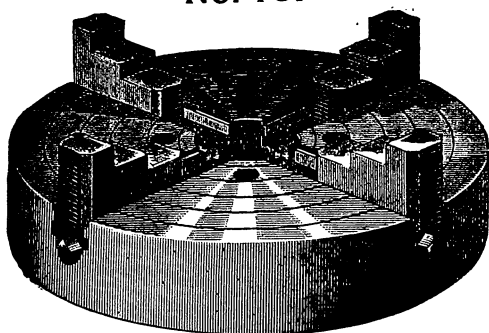
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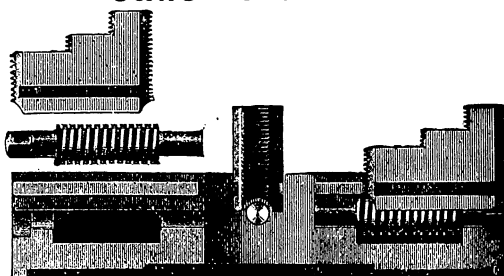
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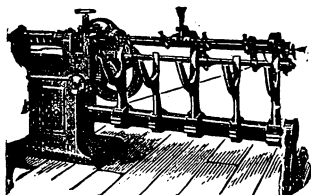
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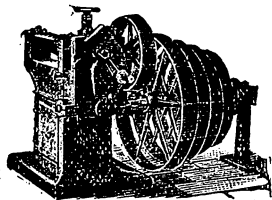
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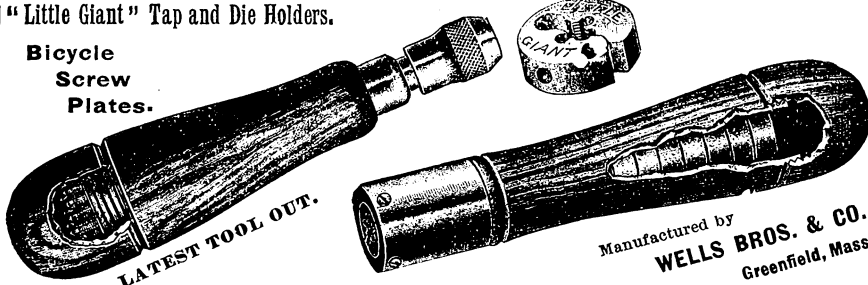


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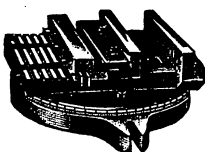
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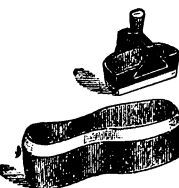
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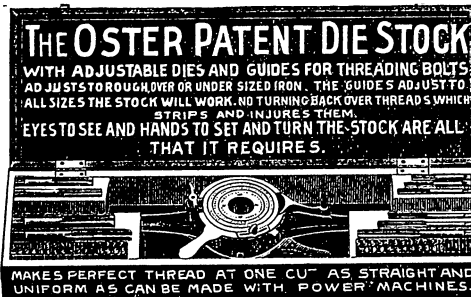
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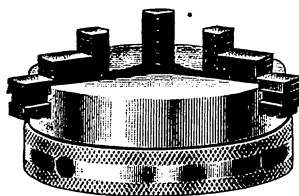


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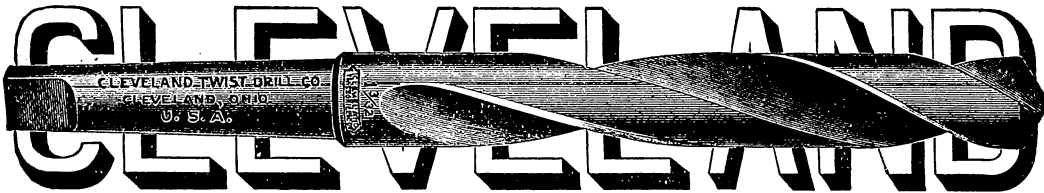
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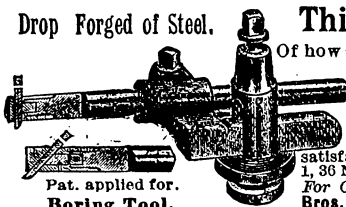
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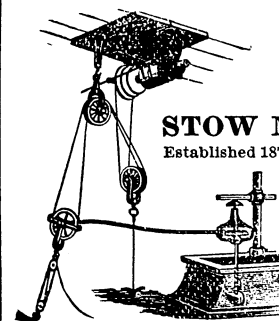
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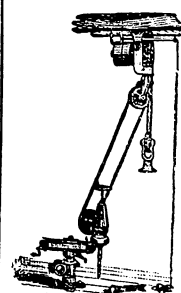
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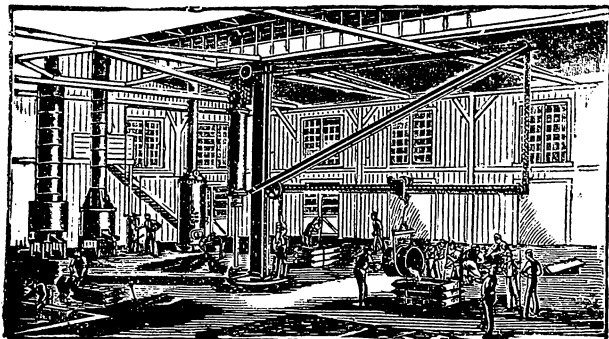


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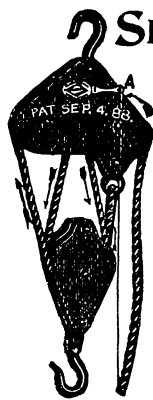
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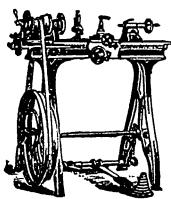
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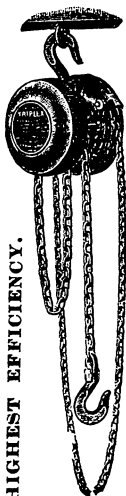
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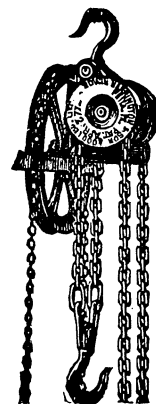
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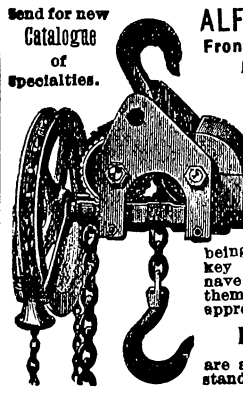
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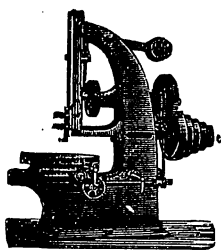
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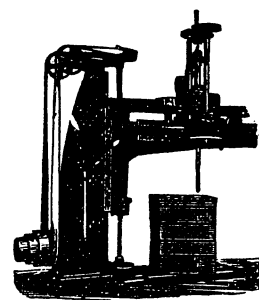


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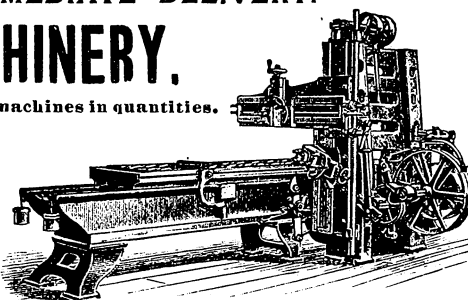
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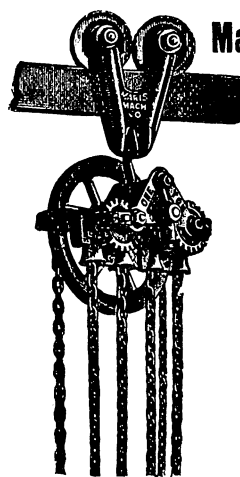
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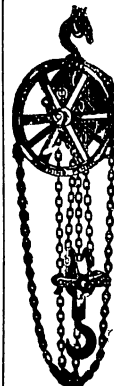
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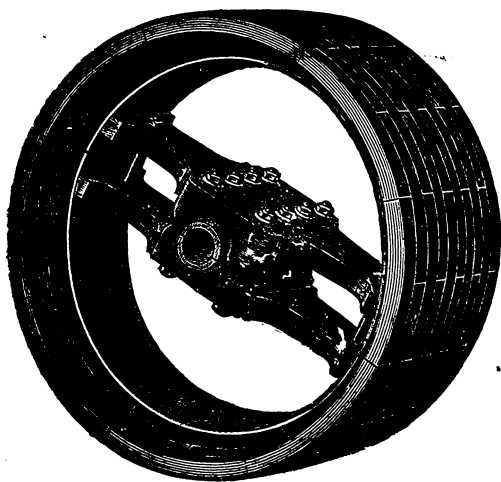
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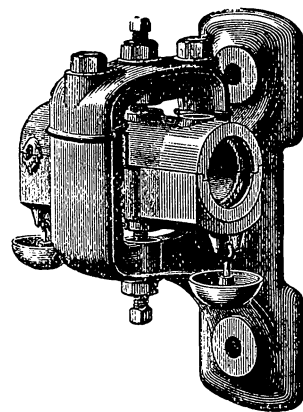
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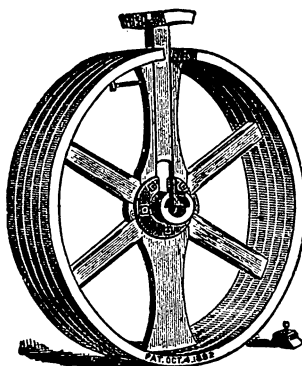


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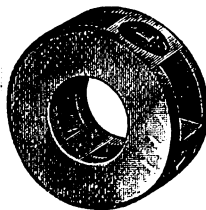
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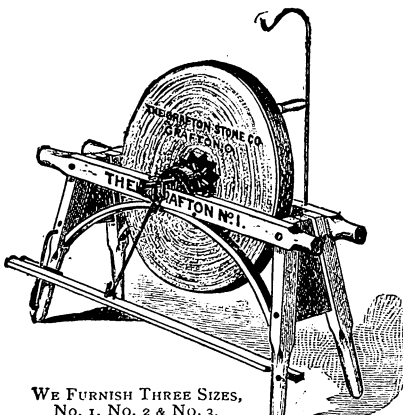
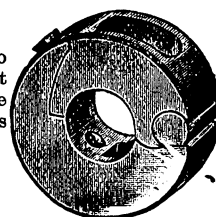
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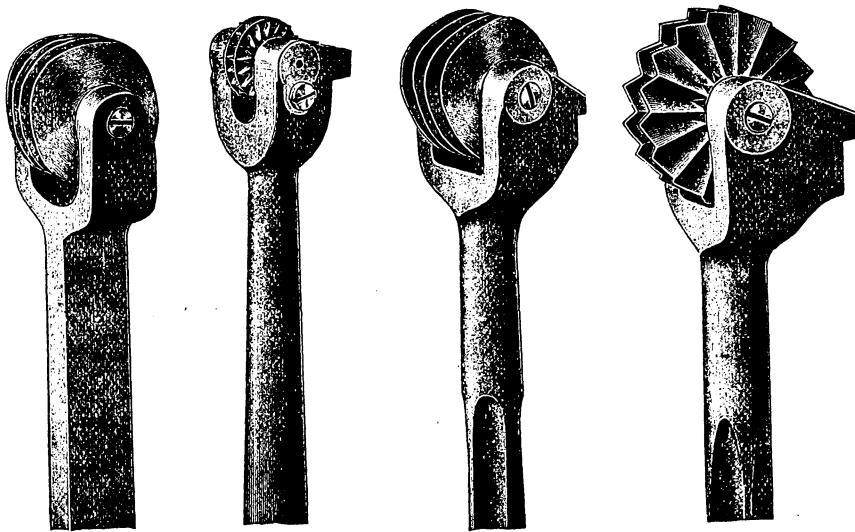
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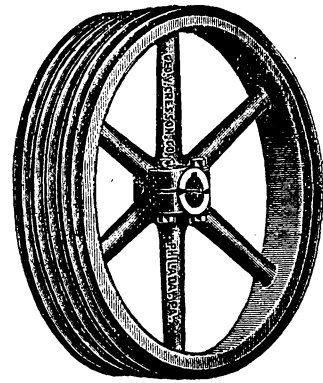
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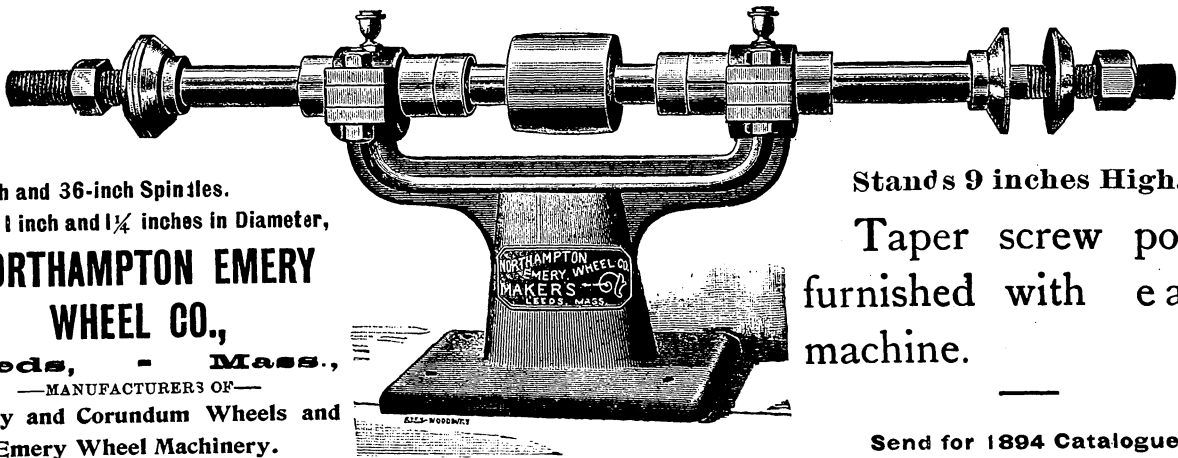
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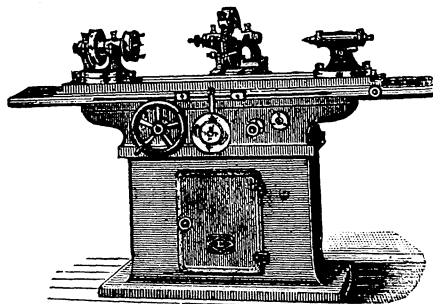
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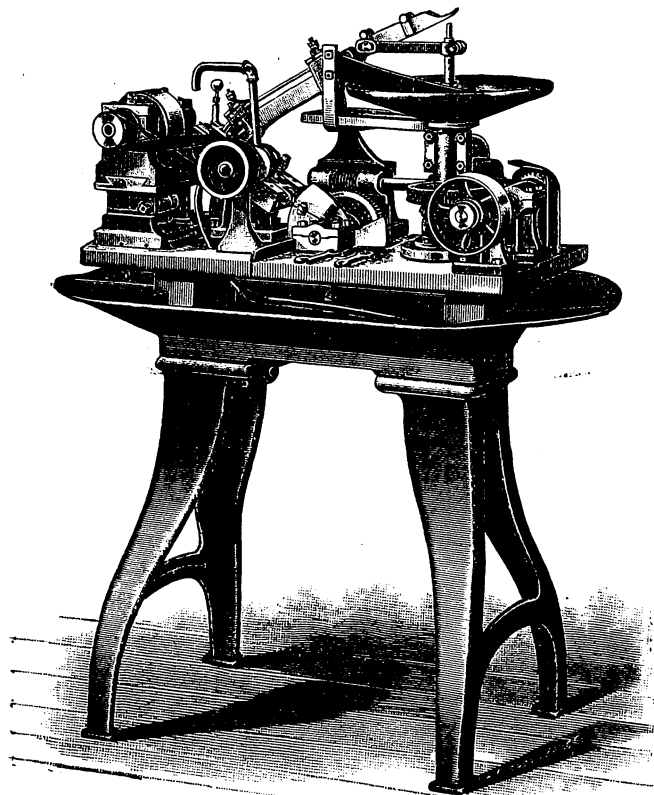
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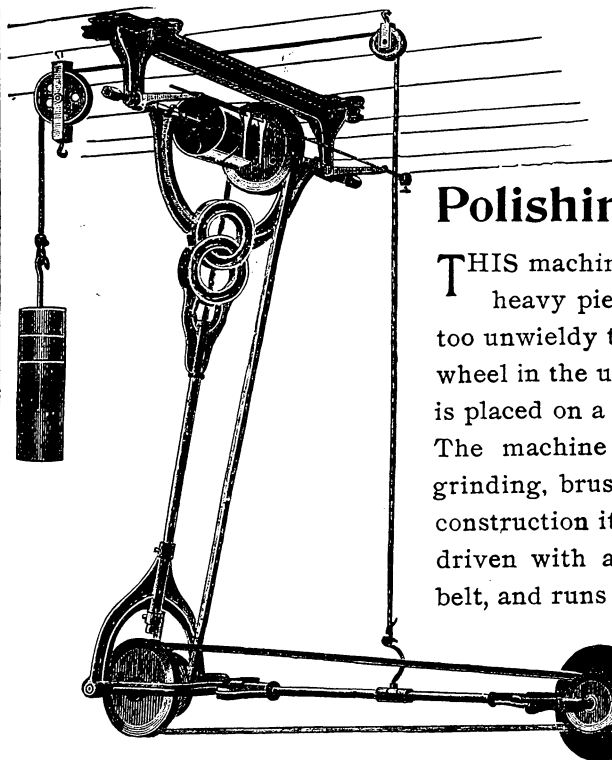
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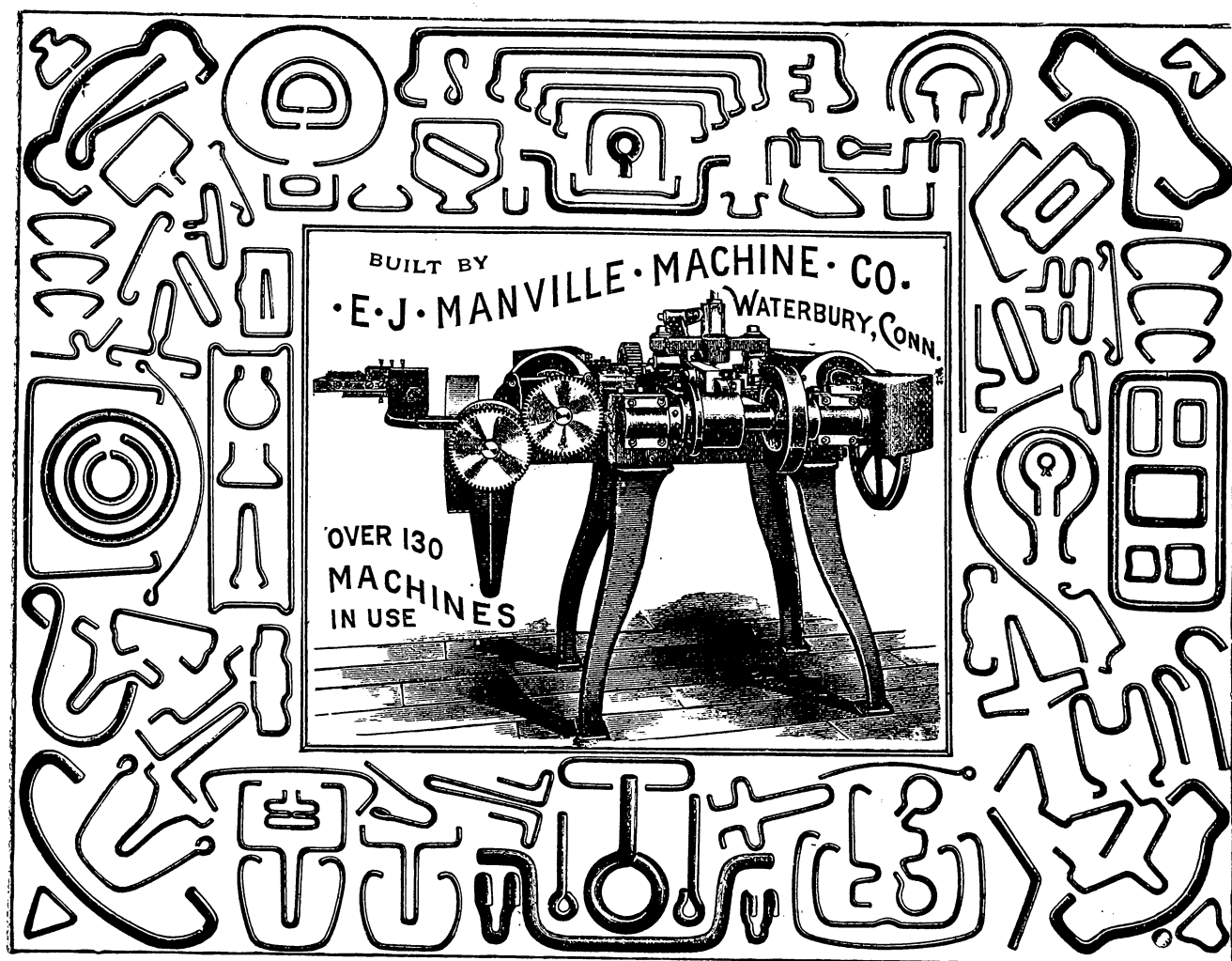
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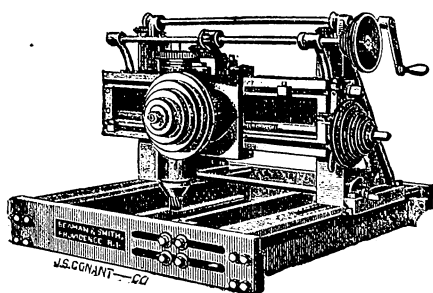
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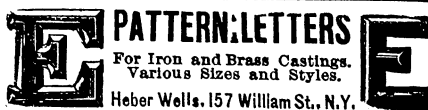
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- 2 16 in. Muck Trains.
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CORLISS ENGINES, 36 in. dia. and under.
PUMPS of all kinds and sizes.
DYNAMOS, 50 to 500 light capacity.
BOILERS, (Stationary.) 4-150 H. P.
LOCOMOTIVE BOILERS, 20-250 H. P.
AIR COMPRESSORS. (6 Sizes).
ROCK DRILLS, 1 1/2 in., 5 in. dia.
ICE MACHINES, 2 of 15 tons each.
HOISTING AND DREDGING ENGINES, 10-500 H. P.
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Write for what you need to

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DOUBLE CORLISS CONDENSING ENGINE, 600 H. P., One 15 inch by 42 inch Corlies Engine, 125 H. P. Double Automatic Engine, 350 H. P. two 100 H. P. Phoenix Automatic Compound Engines, 45 and 5 H. P., Westinghouse Engine, one 80 H. P. Beck Engine, one 7 x 7 Southwark Automatic Engine, one 4 H. P. Otto Gas Engine, 100, 200, 300 and 500 H. P. Feed Water Heaters, 30 to 100 H. P. Return Tubular, 70 H. P. Locomotives, 60 H. P. Vertical Boilers, good for 100 pounds.

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SOME BARCAINS HERE.

1 Hendey Shaper, 16 in. stroke, imp. vise.
1 14 x 6 Screw Cutting Engine Lathe. New.
Pattern Makers' Speed Lathe. 7 ft. Bed, \$40. New.
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44 in. C. & D. Resaw. Fine condition.
Radial Drill, 5 1/2 ft. arm.
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Quantity 2d hand Dodge Pulleys. Cheap.
Safety Construction Company's combined Trap and Pump.

And other machinery, new and second hand. Write for prices. Machinery Supply Company, 89, 41 and 43 Central Ave., Rochester, N. Y.

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Corliss-26 x 48, 23 x 36, 30 x 72, 10 x 20. Several large sizes guaranteed, viz.: 18 x 48, 23 x 48, 28 x 48, 30 x 48, 26 x 60. Many other sizes on hand. Porter-Allen 11 x 16 and other High Speeds. An assortment of Horizontal Tubular Boilers, Large Duplex Fire Pump, Brennan Crusher, Platform Scales, Burr Mill, Bogardus Mill, etc., etc.

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20 Arc Light U. S. Electric Lighting Co. Dynamos.
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Dealers in Scrap Iron, Metals, Machinery, etc.

WE WANT TO BUY SCRAP,

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Will pay spot cash for the above in carload lots.

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- 16 in. x 16 in. x 3 ft. Walter Bros.
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Also a large number of other machines. Write for complete list and detailed description.

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Baker Blowers, Nos. 3, 4, 5, 5 1/2, and 7 1/2.
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Worthington Duplex Pump, Compound, 25 in. x 43 3/4 in. x 9 1/2 in. x 36 in. equal new.
D. W. Pond Planer, 26 in. x 26 in. x 8 ft., equal new.
Niles Boring and Turning Mill, 37 in., equal new.
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Numerous Engines, Boilers, Pumps, Tanks, Crushers, Compressors, Rock Drills, Hoisting Engines, &c., cheap.
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Planer 28 in. x 24 in. x 7 ft. New.
Drill Press, 40 in. swing. New.
Engine Lathe, 24 in. x 25 ft. bed. 2d hand.
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Improved 36 in. Band Saw. New.
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Open die Bolt Cutter 1/4 to 1 1/4 in. 2d hand.
Write us before buying. COOKE & CO.,
Machinery and Supplies, 163 and 165 Washington St., New York.

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Two Double Deck Boilers, 40 H. P., Cheap
Iron Tanks, Square, 4 x 4 x 6, 4 x 4 x 8, 4 x 5 x 11.
Cylinder Boilers and Flues from 8 in. to 36 in. diameter, for stacks and water. Two Radiators.
25 H. P. Engine and Boiler, Horizontal. 25 H. P. Locomotive Boiler. Iron Columns, several sizes. One Lathe. Blow-offs, all sizes.
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FLY WHEEL
made by Garrison, Pittsburgh; 18 ft. diam.; weight 20 tons; 8 sections. Also 10 inch Shaft for same.

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MACHINERY FOR SALE.

- 1 Corliss Engine, 24 x 49 Cylinder, built by Robert Wetherill & Co. of Chester, Pa., with main shaft and fly wheel.
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Well equipped small Machine Shop at Elizabethport, N. J. 25 H. P. Engine and Boiler complete, Lathe, Shaper, Drill Press, Forge, etc. All with shafting, belting, tools, etc., complete, ready to run. Will be sold cheap or rented to a good tenant. Apply to

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SECOND-HAND MACHINERY.**ENGINE LATHES.**

10 in., 11 in. and 13 in. Swing, 4 and 5 ft. Bed Lathes, Reed, Prentice and L. & M.
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1 17 in. x 17 in. x 30 in. Hand Planer.
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2 20 in. Drill Presses, Prentice & Davis.
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15 in. Stroke, Smith.
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10 in., 12 in. and 14 in. Swing, 3, 4 and 6 ft. Beds, Garvin and Spencer.

ALSO LARGE STOCK NEW TOOLS.

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RAILS FOR SALE. Second-hand Relaying.

1000 tons 60 lb. Steel.	50 tons 35 lb. Iron.
150 " 60 lb. "	150 " 30 lb. "
1000 " 58 lb. "	360 " 25 lb. Steel.
150 " 52 lb. Iron	60 " 20 lb. "
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40 tons 40 lb. Iron.	Johnson Girder
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27 different gauge second-hand locomotives.	

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**OLD RAILS
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Ready for instant delivery, 1000 tons new standard 9 in. high 90 lb. side bearing Girder Rails with fittings complete.

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By a thoroughly equipped general foundry and machine works, some specialty to manufacture in large quantities in machinery or heavy hardware line. Would also undertake to market the product if desired. Address

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Well equipped general machine shop and foundry; 7 lathes, planer, shaper, etc.; fine stock of patterns. Good supply of tools. All in good condition. Fine location. Railroads in 11 directions through the most prosperous section of the South. Only one manufacturing competitor. Fine chance for a young man or for a branch business. Will sell on easy terms. Wish to retire on account of age.

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20 in. x 8 ft. Pattern Lathe.

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 1 Brainard Universal Cutter Grinder.

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1 Plain 12 in. Monitor, 4 in. Chuck and cut-off Hand Turret.
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Complete plant of machinery of the Hickory Wheel Co., at So. Framingham, Mass., for making bicycles. Run about a year only and as good as new, consisting of

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polishing and grinding machines, special wood working machines for making wood rims.

Send for special circular B 31.

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Two Guild & Garrison Steam Pumps, 18 in. steam cylinders, 12 in. water cylinders, 24 in. stroke, strictly first-class. Capacity 600 gallons each per minute at ordinary speed.

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One No. 5 Root Blower, in use about two years. In perfect condition. Also one Cupola Shell, 72 inches in diameter, 45 feet high, 1 1/2 feet to bottom of charging door.

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**Heavy Pressure
PUMPS****FOR SALE CHEAP.**

Two pairs of

**Worthington Compound
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14 in. x 24 1/2 in. x 3 1/2 in. x 18 in. stroke. Adapted to 2000 lbs. pressure per square in. In good order. Complete, with condensers.

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**Upright Boring and
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60 in. swing, with two heads. Modern Style. Heavy pattern. All order. Will be sold low before moving. Address

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Three Tubulars, 72 in. x 18 ft., 72 4 in. flues, with patent stokers. All in good condition. Address

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The advertisers are ready to place a contract for about \$75,000 per year of heavy machinery. Builder's plant should consist of foundry, machine shop and boiler shop. If your plant is suitable for this work, or can be readily made so, send address, and particulars will be furnished.

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To buy for cash, first-class second-hand Engine Lathes, Planers, Drill Presses, Shapers, Milling Machines, Etc., Address

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Offers for sale at very low prices BESSEMER STEEL WORKS; STRUCTURAL STEEL MILLS, also STEEL MILL FOR ROLLING BARS AND COLD ROLLING, 2 BLAST FURNACES, RUSTLESS IRON WORKS, GLASS WORKS, FOUNDRY, PLANING MILL, BRICK WORKS, and numerous other manufacturing interests and large quantity of very desirable Coal Properties improved and unimproved.

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Foundry and Machine Shop at Bellevue (Schenectady), N. Y., consisting of main building 112 ft. x 90 ft., with Gallery, Store house 120 ft. x 20 ft., Blacksmith Shop 40 ft. x 18 ft., Pump House, containing 15 in. Duplex Pump piped ready for operation, with fire hydrants throughout building. Annex to main building 200 ft. x 43 ft. Main building contains Yale & Towne 10-ton electric crane 40 ft. span, which runs entire length of building, also two 10-ton Foundry Cranes. Cupola 42 in. inside lining, with No. 8 Sturtevant Pressure Blower; Cupola is piped and lined ready for operation. 75 H. P. Boiler, Engine, Line Shafting, Oven for drying molds 16 ft. x 12 ft. x 10 ft. with track and car, and in fact everything necessary for a complete foundry plant ready for immediate operation. This property contains ten acres of land and is underlaid throughout with molding sand of best quality. A stream of pure soft water of 2,000,000 gallons capacity per day crosses the lot. Double track railroad siding on lot. Fairbank's R. R. Scale and Wagon Scale. This plant is entirely new and has never been started. Must be seen to be appreciated. Will be sold for one-half the cost of building alone. Address, for further information,

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 ELECTRIC MOTORS,
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The Receivers offer for sale the entire Plant of this well known Corporation, located for 50 years at South Newmarket, N. H., manufacturing Engines, Boilers, Steam and Hot Water Heating Apparatus, Gas Retorts, Shoe Machinery, Steam, Water and Gas Pipe and Fittings, and doing a General Iron and Brass Founding and Finishing Business. Its location is one of the best in New England, being on the Squamscot River, a branch of the Piscataqua, 14 miles from Portsmouth, Rivers being navigable for vessels drawing 11 feet and Co. having Fine Stone wharves fitted to discharge, hoist and house Entire Cargoes of Iron, Coal or Sand or ship Heavy Machinery to Foreign or Domestic Ports without re-handling.

Manufacturing Plant, proper, covers about 104 Acres, on which are the Offices, Stock and Pattern Store Houses, Wood Working and Pattern Shops, Iron and Brass Foundries, and Finishing Shops, Machine, Boiler, Fitting Shops and Pipe Mills, and Furnaces all fitted with suitable improved and valuable Machinery and Tools including Patent Improved Pneumatic Caulking Tools for Boiler-Making, Plate Rolls, Shears, Large Planers, Radial Drills, Pit and other Lathes, &c.

Boston & Maine R. R. runs through the Premises, with sidings permitting rolling of Heavy Machinery from Shop Floors on to Cars. Plant is but 50 feet from Passenger Station and is admirably adapted for manufacture of Stove Castings, Tools and Machinery for New England trade, Electric or other specialties, and Jobbing and Repair work for the numerous Mills and Railroads in New England. In the neighborhood of the Plant are also various Lots of Land, some improved with dwellings, large and small, in good repair, suitable for private residences and boarding-houses for employees, and some Wood lots; all of which we offer for sale.

Entire property, Real and Personal, including Patents, Patterns, Drawings, Stock of Steam and Hot-Water Heaters, Radiators, Stationary and Portable Engines, Upright and Horizontal Boilers, Wrought, Cast Iron and Composition Pipe Fittings, Valves, &c., manufactured and in process, Scrap Iron, &c., Horses, Wagons, Safes and Office Furniture, will be sold as a whole, or in lots to suit purchasers, as may seem best for the interests of all concerned, and offers for all or any portion of it may be submitted to the undersigned.

Further information and permits to inspect the property may be obtained by applying in person or by mail to

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WILLIAM S. EATON, } Receivers,
WOODWARD EMERY,

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New Nos. 17 and 19.

FOR SALE OR EXCHANGE AT LOW PRICES.

One Morgan Steam Hammer, 4000 lbs. stroke. Three Tubular Boilers, 18 feet long, 6 feet in diameter, having fifty-eight 4 in. tubes, with stacks and breeching, also fronts and settings, all in first-class condition.

One Sturtevant Blower, or Fan, No. 39, very large, and in good condition.

One Mine Pump, Duquesne make, with bronze water cylinder.

One Knowles Boiler Feed Pump, No. 7.

One Horizontal Reversing Engine, cylinder 14 in. x 24 in.

Low prices will be made for all or any of the above. We will make an exchange deal for any of the following material.

One Squaring Shear, for cutting iron and steel sheets.

One Stand of Cold Rolls and Housings for the same.

One 30 or 35 ton Fly Wheel.

One Wrought Iron Fly Wheel Shoe.

The above material must be in good condition. For particulars address

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FOR SALE.

- 1 42 x 60 Vertical Corlies Engine.
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- 1 100 H. P. Fire Box Boiler. "New."
- 1 100 H. P. Westinghouse Engine. "Good order."
- 1 Columbus Blowing Engine 16 x 24, 32 x 24.

Also a large number of other engines, boilers and machine tools. Write for prices.

WM. C. JOHNSON & SON MACHINERY CO.,
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A valuable patent which is being manufactured on royalty by a large manufacturing concern and patented in 1893, since which time it has been adopted as the standard in its line by the leading hardware jobbers throughout the United States. Satisfactory reasons given for selling. Address

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You Want Power. Be you large or small. For rent, 57,000 sq. feet of floor space—will split up to suit tenant—Building new—8 stories—factory construction—exterior windows to each floor—Gas, Electric light and power—elevators—rent and insurance low. Address
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ONE METAL PLANING MACHINE.

30 in. x 30 in. x 8 ft.

First-class condition.

THE POWELL PLANER CO.,
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An established wholesale and retail business in Crockery, Glassware, Tinware and Stoves, located in a live city of 50,000 inhabitants. Has been in successful operation for 15 years and is the only crockery and glassware jobbing house in the city and in a radius of 150 miles. The owners have other interests that require their attention is their reason for selling. This is an opportunity that is seldom offered and will pay you to investigate. Business has been well advertised and has a good list of regular customers. This is no forced sale and the good will of the firm is valuable. Stock has been reduced to \$18,000 or \$20,000. Address
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One of the oldest established retail and wholesale Hardware, Stove and Plumbing businesses in Luzerne County. Situated at Wilkes-Barre in the heart of the richest coal field in America. Will sell stock reasonable and charge nothing for good will. Will either sell or give liberal lease on building, which is 25 by 104 ft., six stories high, on one of the most prominent business corners in the city. Our reason for selling is, our manufacturing business in another part of the city has grown to such proportions that we desire to devote our entire attention to same.

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186 East Market St.,
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FOR SALE.—To close an estate, on account of death of principal. An old and well established jobbing and retail Hardware business, located in one of the largest manufacturing cities in the State of California. The best location in the State outside of San Francisco for a jobbing business. Stock is well assorted and consists of shelf and builders' hardware, mechanics' tools, bar and sheet iron, etc. Will inventory about \$40,000. Terms and statements to principals only. Address "A. B. C.," Box 104, office of The Iron Age, 96-102 Reade St., N. Y.

WANTED.

By a large manufacturing establishment some new specialty to make and sell to the Jobbing Hardware, Crockery or Grocery trade. Address

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Scranton, Pa. Fine location. Good trade. Clean stock. Equipped for Tin work and Plumbing. Stock valued at \$4000 to \$5000. Reason for selling, owner's health failed. Address "F. M. S.," 1223 Washburn St., Scranton.

THE NORTH BRANCH STEEL CO. offer FOR SALE OR LEASE

for a term of years, their Bessemer Plant and Blooming Mill, situated at Danville, Penna., which is on the line of the Catawissa Branch of the P. & R. R. R., the Bloomsburg Branch of the D., L. & W. R. R., and within 12 miles of Northumberland, through which the Northern Central Branch of the Penna. R. R. passes. These contain two 4-ton vessels and a 32 in. reversing mill. The plant is entirely new and practically ready for operation. A home market exists for a large part of its product, and the starting up of this plant would make Danville an excellent location for a Tin Plate Works. Full information may be obtained of the NORTH BRANCH STEEL CO., 26th St. and Washington Ave., Philadelphia, Pa.

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Party with \$10,000 to take position of book-keeper in large manufacturing concern near Chicago. Investment guaranteed. Splendid opportunity for young man to associate in an established business. Hardware manufacture, staple articles. Address
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WANTED.

An old fashioned helve hammer of about 200 lbs. Must be in good condition. Address
THE SAFETY AXLE CO.,
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TO LET FOR MANUFACTURING USES.

At South Easton, Pa., on line of Lehigh Valley Railroad and on Lehigh Canal. Sidings in buildings. Electric light. Electric street railway. One main 2-story building, 275 ft. x 45 ft. Steam Engine, Shafting and complete appurtenances for first-class factory or machine shop. One high 1-story building, 80 ft. x 45 ft. Cement floor. One 2-story building, 35 ft. x 45 ft., ground floor suitable for smith shop, etc.

These buildings were erected for galvanizing and barbed wire plant, and more recently, for several years, have been in the occupancy of The National Switch & Signal Co. They form part of the plant of The Stewart Wire Co., being separated from its main plant by the Lehigh Canal. Affords a most desirable opportunity for industry using wire in any of its forms and is an exceptionally fine location for manufacture of any character.

Will be let in whole or in part, with or without the adjacent thoroughly equipped and complete Wire Drawing Mill steam and water power, situated on same side of Canal. For further particulars address

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TO RENT.

A comfortable and convenient office, nicely carpeted, steam heat and gas, including desk and office furniture, on second floor, No. 246 Murray St. Also floor space if desired. Cheap to the right party.

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LOFTS TO LET.

Second, third and fourth lofts. Steam heat and elevator. Building has been thoroughly overhauled. Immediate possession. JOHN F. DOYLE & SONS, 45 William Street.

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A modern equipped construction plant, consisting of Foundry, Machine and Pattern Shops, with trade established for ten years. Large and valuable lot of patterns and drawings. Doing a business of \$150,000 per annum. Well located for railroad facilities. Amount of capital invested \$50,000. One-half cash and balance long time. An opportunity seldom met with. Business has always been profitable. The plant must be sold to settle an estate. None need apply but those meaning business, to whom full information will be given. Address "PLANT," care The Iron Age, P. O. Box 521, New York City.

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A valuable United States patent. Can be manufactured at a small cost and sold for a good price to dealers in machinists' tools, hardware manufacturers, clock manufacturers, &c. Nothing of the kind on the market. Will be sold cheap and full particulars given.

P. J. CONROY,

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FOR SALE HOISTING ENGINES

MANUFACTURED BY

THE JOHN F. BYERS MACHINE CO.
RAVENNA, OHIO.

WRITE FOR CATALOGUE.

WANTED.

A lot of 1 in. and 1½ in. Wrought Iron Steam Pipe, new or second-hand, to be used for railing purposes. Factory seconds would answer. Address 105 Market St., Camden, N. J.

Standard Scale and Fixtures Co.,

DEALERS IN AND JOBBERS OF

Standard Scales, Warehouse Trucks, Baggage Barrows, Wheelbarrows, Car Movers, Money Drawers, etc., etc.

Standard Scale & Fixtures Co.,
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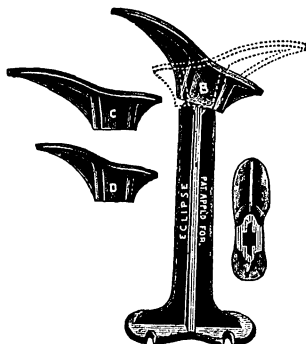
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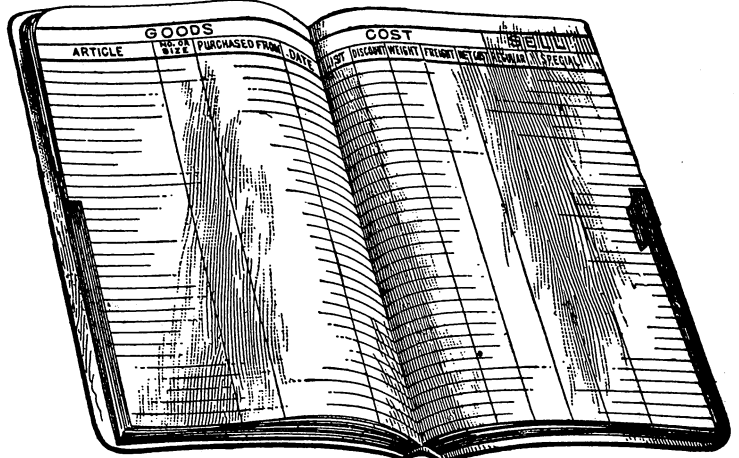
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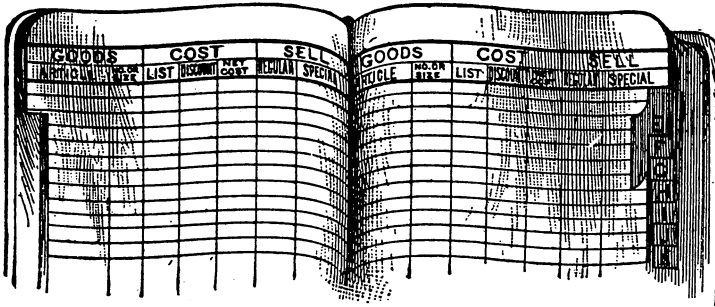
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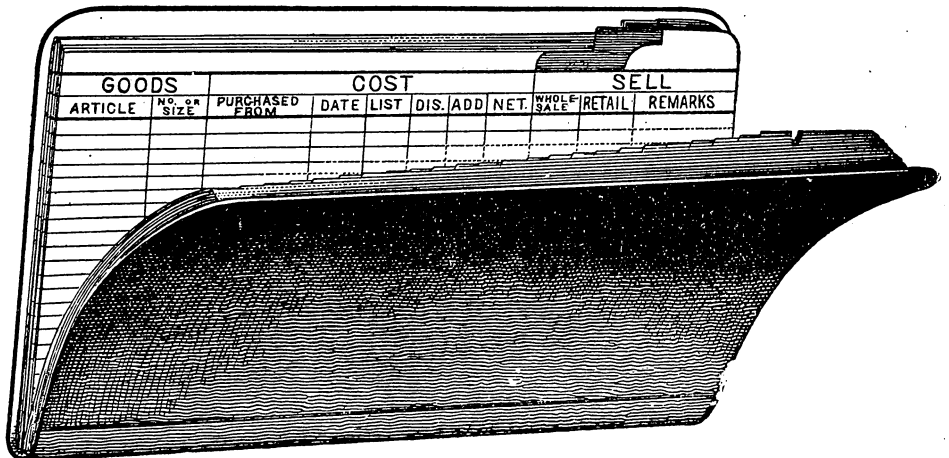
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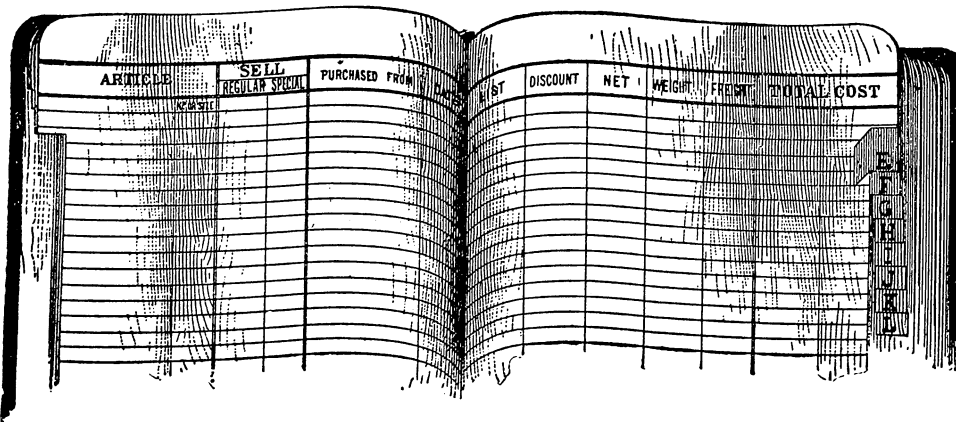
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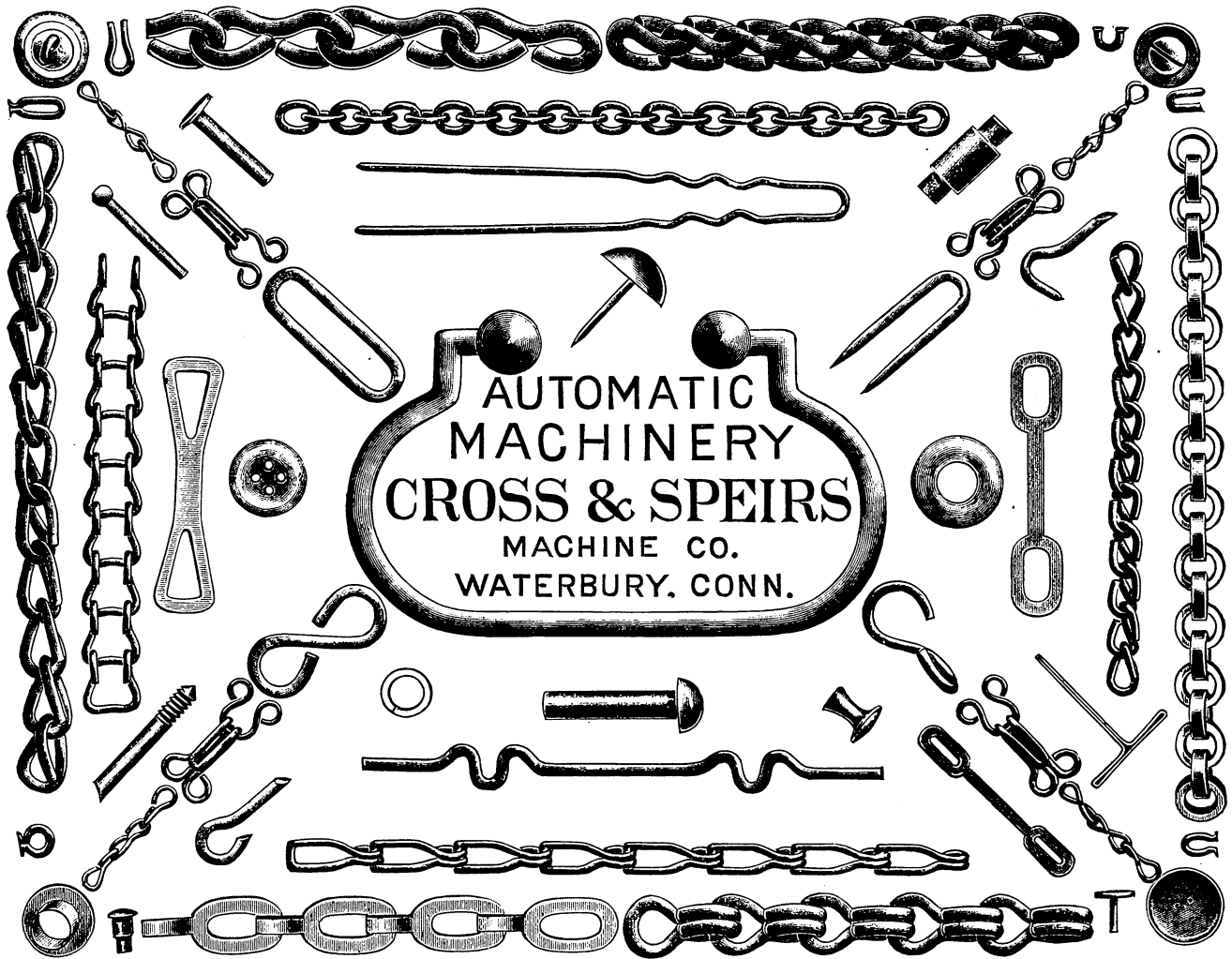
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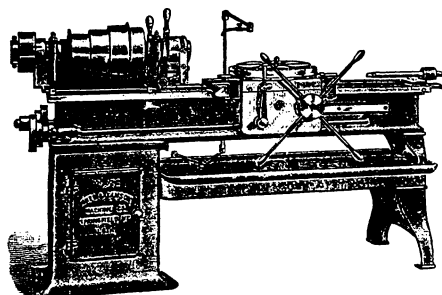
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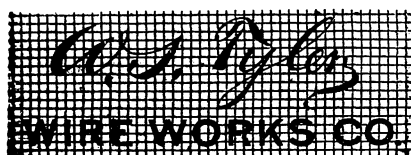
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JONES & LAMSON MCH. CO.,

SPRINGFIELD, VERMONT, U. S. A.



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"The Tyler"

Double Crimped Wire Cloth for Mining Purposes.

All meshes from two to the inch up to 100 mesh made and carried in stock.

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Ingots, Plates, Bars, Sheets,
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HENDEY-NORTON LATHE

Is a Modern Machine Tool Its Improvements are Practical and Simple, making it the most Useful, Convenient and Economical Engine Lathe made.

FEEDS.

All the feeds in daily use can be obtained by the simple movement of a lever.

THREADS.

All the threads to be cut in ordinary daily use can be cut by simple movement of a lever.

REVERSE in APRON.

Enables the operator to cut threads WITHOUT touching the countershaft lever, allowing Spindle to run continuously in one direction. No Slamming of Counter Shaft or strain of belts in REVERSING Spindle.

AUTOMATIC STOP.

It Automatically stops the Carriage in EITHER direction when feeding or thread cutting, removing all danger of running into the shoulders in turning or thread cutting, in BOTTOM of holes or internal thread cutting. It is especially valuable in DUPLICATING pieces.

Buy the Best. Send for Catalogue.

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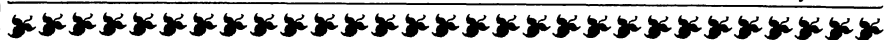
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Spring Vise Jaws for holding thin tubing.

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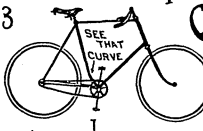
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DON'T let the grass grow under your feet.

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"365 DAYS AHEAD OF THEM ALL"
17 to 23
MAJESTIC BICYCLES
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CATALOGUE FREE



Lines ^AND ^ARE Prices ^ARE Right.

We shall have an agent in every town. Speak early.

MAJESTIC Light Roadster BICYCLES.

Weight, 23 lbs. List, \$75 00.

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Gentlemen:—I have ridden and sold the Majestic the past two seasons, and they have given me the best of satisfaction. I find they stand up well and need but very little repair, and that is quite an item in buying a wheel. The No. 4 is par excellence. I want the agency next season.

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THE
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FREEZER.

Heavy Waterproof Tubs. Cans of Charcoal Tin-plate. Malleable Iron Dashers. All inside parts tin-plated. Gearing completely covered.

Inquire of any leading jobber or write us.

THE
BEST
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The White Mountain Freezer Co., Nashua, N. H.

GATE HINGES AND LATCHES,

BLIND and SHUTTER HINGES

And FRAME PULLEYS of the Original "Clark" and other patterns formerly sold by

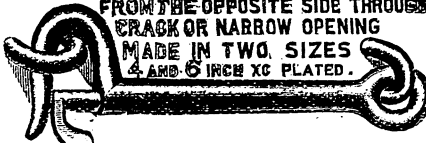
THE SHEPARD HDW. CO. of Buffalo, whose business in these lines we have acquired by purchase.

MANUFACTURED ONLY BY

THE WRIGHTSVILLE HARDWARE CO.,
WRIGHTSVILLE, PA.

Surplus, Dunn & Alder, 15 Murray Street, New York Agents. Henry Keidel & Co., Southern Agents, 25 Hanover Street, Baltimore, Md. Chas. L. Pierce & Co., 202 Market Street, San Francisco, Cal.

COVERT'S SELF-LOCKING,
GATE AND DOOR HOOK.
POSITIVELY PREVENTS BEING UNHOOKED
FROM THE OPPOSITE SIDE THROUGH
CRACK OR NARROW OPENING
MADE IN TWO SIZES
4 AND 6 INCH XC PLATED.



Our Banner Bolt and Triumph Spring Snaps take the lead both in price and quality. Our Web, Rope and Leather Halters, Horse and Cattle Ties are standard the world over. We are headquarters and the most extensive manufacturers in Saddlery, Coach and General Hardware Specialties.

CORRESPONDENCE SOLICITED.

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Columbia Bicycles

\$100.

Hartford Bicycles, \$80.

Wizards, \$60, \$50.

The above will unquestionably be the easiest line of bicycles to sell in 1895, and the dealer who has the exclusive Columbia agency for his vicinity will be fortunate. We invite correspondence with enterprising firms of good standing who have facilities for doing a first-class bicycle business.

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DIPLOMAS AWARDED. Courses in other trades, all including thorough instruction in Mathematics and Physics. Send for FREE Circular, stating subject you wish to study, to The Correspondence School of Mechanics, Scranton, Pa.

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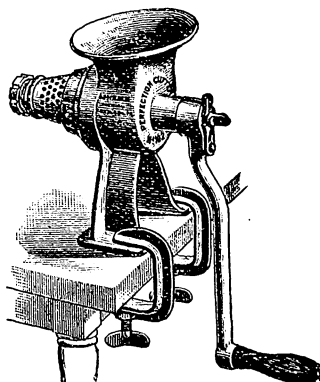
1894 PATTERN

Perfection ... CUTTER.

Manufactured by

NORTH BROS. MFG. CO.,
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JOHN H. GRAHAM & CO., Mfrs. Agents,
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THE LATEST, BEST, MOST PRACTICAL,
AND IMPROVED FOR FAMILY USE.

Simple to use. Easy to clean.
Of few parts.

Requires no repairs.

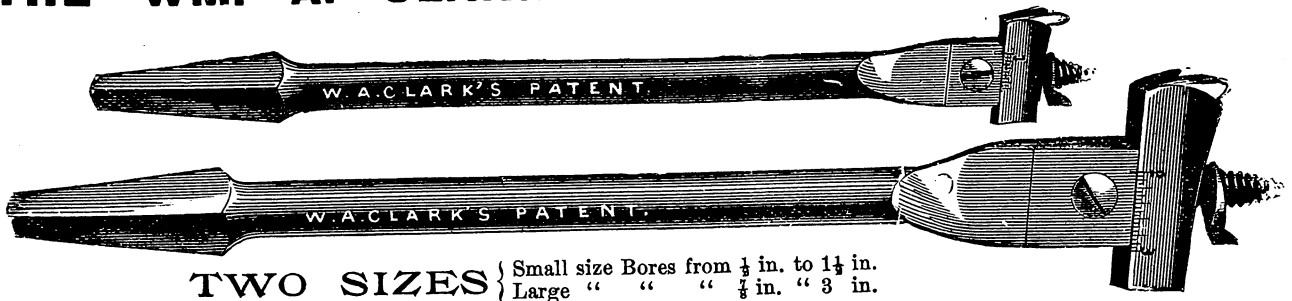
Easily put together and taken apart.

No parts to wear out or become dull.

Does not mash or grind meats, etc.

All parts coated with pure black Tin.

THE WM. A. CLARK PATENT EXPANSIVE BIT.



TWO SIZES { Small size Bores from $\frac{1}{4}$ in. to $1\frac{1}{4}$ in.
Large " " " $\frac{3}{4}$ in. " 3 in.

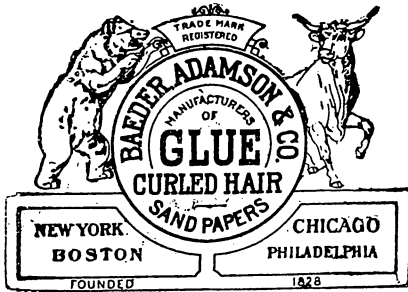
SPECIAL CUTTERS: No. 5—For Large Bit, Bores from 3 in. to 4 in. No. 6—For Large Bit, Bores from 4 in. to 5 in

Stock and workmanship superior to all others. Every part interchangeable.

Quality guaranteed. For sale by all Hardware Dealers.

Manufactured by **R. H. BROWN & CO.,** New Haven Conn

*You take no risk on the quality
We make only the best!*



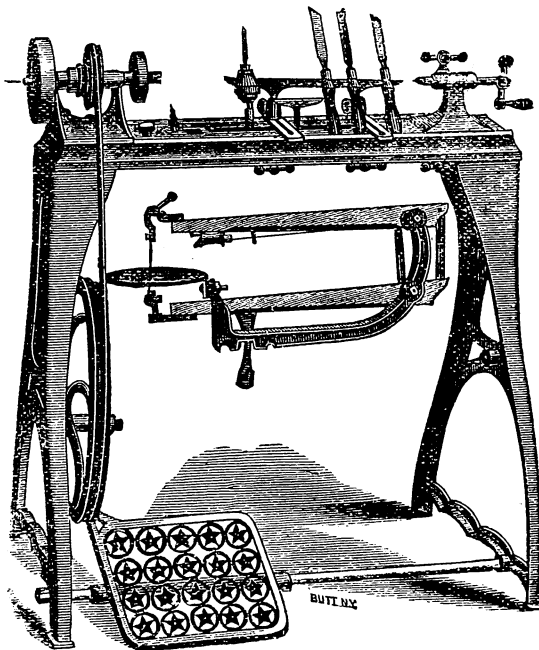
Sand Papers { Flint Paper
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HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

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162 LAKE STREET, CHICAGO.

HOLIDAY GOODS.



Many kinds of Scroll Saws have been put on the market by ourselves and other manufacturers during the past twelve years. Of these only a few have proved good enough to remain in demand. The call now is for a well-made, practical machine, and all second-class ones are of slow sale.

Those who want a good Lathe with Scroll-Sawing Attachment and all Tools and Improvements to the very latest moment will buy the Goodell Lathe.

Those who want only a Scroll Saw with Drilling Attachment and Rubber Blower will prefer the Rogers Saw.

These two machines are taking the place of all others, and are now the most in demand throughout the world.

No dealer can make a mistake by laying in a stock of them. About Christmas time they are wanted in every town, and will make business lively at this otherwise dull season.

We also keep a full stock of Designs, Wood, and all other Scroll Sawing goods.

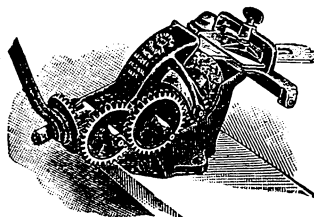
Price of Goodell Lathe, complete, \$12.00.

Price of Rogers Saw, complete, \$3.50.

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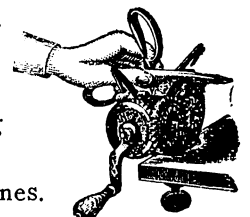


We make five sizes, Nos. 1, 2, 3, 4, and 5.

No. 1 for joiners' use.

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Nos. 4 and 5 power machines.

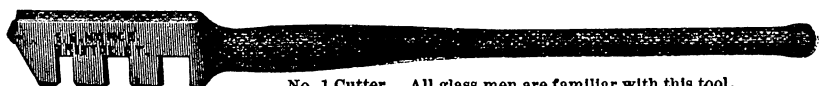


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18 Cliff St., New York, N. Y.

MONCE'S NOVELTY GLASS CUTTERS. — INTERCHANGEABLE LOCK STENCILS.



No. 1 Cutter. All glass men are familiar with this tool.

S. G. MONCE, BRISTOL, CONN.

Palmer's Common Sense Frame Pulley.



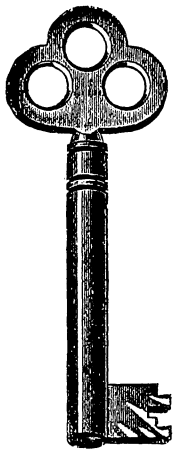
Each pulley its own Marking Gauge
ALL HAVE STEEL AXLES

MANUFACTURED BY

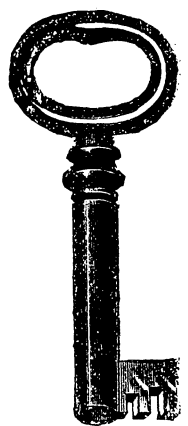
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CABINET LOCKS

OF EVERY KIND.



DRAWER LOCKS,
CUPBOARD LOCKS,
WARDROBE LOCKS,
CHEST LOCKS,
DESK LOCKS.



A complete line of more than 1000 list numbers exclusive of our old
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YALE CABINET LOCKS.

THE YALE & TOWNE M'F'G CO.,

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The only question is Is it Le Page's?

If it is you have made a sale. **HUNDREDS** of **THOUSANDS** of **PLEASED** and **SATISFIED** **CUSTOMERS** testify to the merits of

LE PAGE'S LIQUID GLUE.

If you sell it you do not have to **WASTE ANY TIME** in answering questions as to its quality.

The people **KNOW** that **LE PAGE'S GLUE** is the **BEST**. They have used it for years and have proved our claims to be true.

It is the only Glue made WITHOUT ACIDS.

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Don't let your customers go to another store for what they want, but **SELL THEM WHAT THEY ASK FOR.**

We can furnish original and attractive advertising matter for "**LE PAGE'S GLUE**" upon request.

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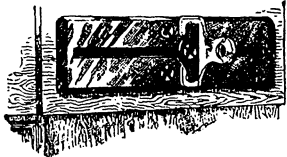
RUSSIA CEMENT CO., Gloucester, Mass.

NEW YORK OFFICE, 95 Reade and 113 Chambers Streets.

PACIFIC COAST OFFICE, 23 Davis St., San Francisco, Cal.

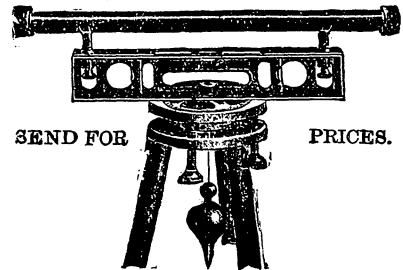
EVERY OWNER OF A HOUSE

ought to know about the "Salem" hanger. A **DOZEN** **TENANTS** can hang a **DOZEN** **DIFFERENT** **WIDTH** shades and not use a screw. A **HOUSE** **TEN** **YEARS** **OLD** with the "Salem" on the casing will not have one damaging screw hole, where a house without it will show **HUNDREDS**. The hardware trade gladly supplied with samples and prices.



The W. A. South Co., Salem, Mass.

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C. F. RICHARDSON & SON,
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Manufacturers of Iron Levels and Carpenters,
and Architects' Transits.



WM. KROGSRUD,
Engraver and Die Sinker,
61 Fulton St., N. Y.
Manufacturer of
STEEL STAMPS
For Every Purpose.
Steel Letters and Figures.
Burning Brands, Stencils,
&c. Send for Illustrated
Catalogue.



CHAS. W. HOEFIG,
ENGRAVER AND DIE SINKER,
52 FULTON ST., N. Y.
STEEL STAMPS,
BRASS DIES, BURNING BRANDS, &c.
Designs on Steel Finely Executed.



MORFORD'S
Latest Improved
Safety Alarm Cash Tills.

Patented July 10, 1894
Size, 17 x 18 inches. Narrow
Counters, Size 13 x 18 inches
Prices the same for either drawer.

The only Cash Drawer on the market which will give the alarm in either case by pulling the right or the wrong keys. Cannot be tampered with unless giving the alarm.

THE MORFORD REGISTER CO.,
Mfrs. of Cash Tills and Cash Registers, 7
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Engine Room Chat. By **ROB. GRIMSHAW.** This little book presents in colloquial style ideas which appeal to all interested in the generation of power, more particularly those charged with the care of engines and boilers and their appurtenances. 148 pages, cloth, \$1.00
For sale by **DAVID WILLIAMS, 96-102 Reade st., N. Y.**

W. & B. DOUGLAS, MIDDLETOWN, CONN.

Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

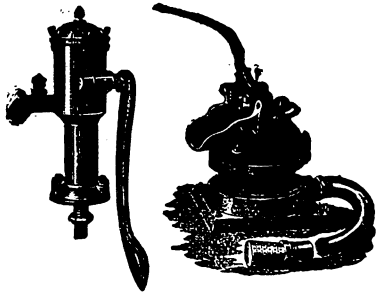
A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries;

Fig. 309.

Fig. 381.

Fig. 145.



or wherever it is desired to raise a large quantity of water by hand power.

The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

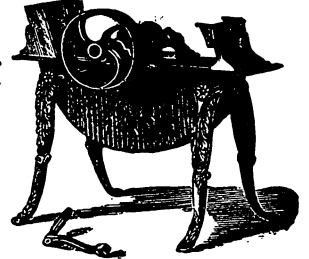
CAPACITY

from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced.

Made either as shown in out for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.

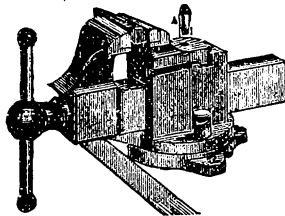


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THE DEMING CO.
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MANUFACTURERS OF
HAND & POWER PUMPS, WELL SUPPLIES & C. VERTICAL STEAM PUMPING ENGINES.
ARTESIAN WELL CYLINDERS, HYDRAULIC RAMS.
N.Y. OFFICE: 72 JOHN ST.
HENKON & HUBBELL
GEN'L WESTERN AGT'S: 55 & 57 N. CLINTON ST. CHICAGO, ILL.

PRENTISS' PAT. VISES.

The Leaders for 20 Years.



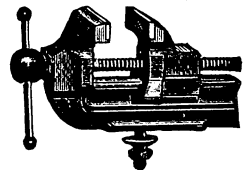
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ALL KINDS OF VISES.

PRENTISS VISE COMPANY,

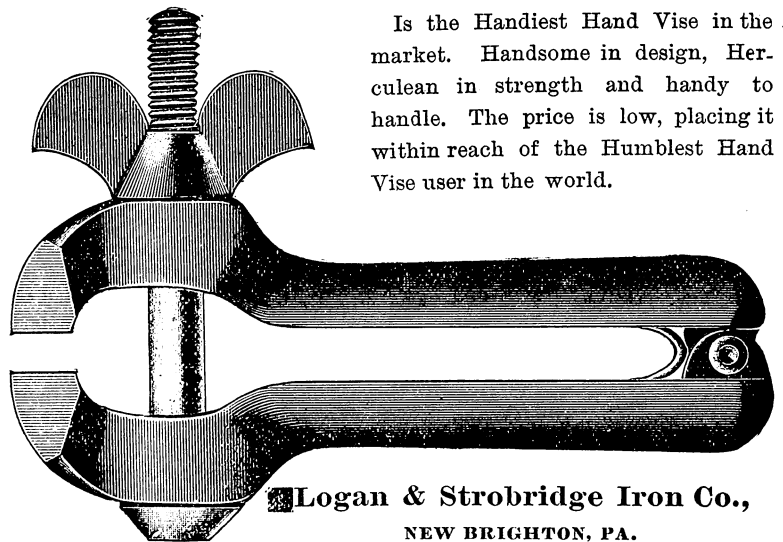
MANUFACTURERS,

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BRIGHTON HAND VISE.

Is the Handiest Hand Vise in the market. Handsome in design, Herculean in strength and handy to handle. The price is low, placing it within reach of the Humblest Hand Vise user in the world.



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Logan & Strobbridge Iron Co.,
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+ CATALOGUES FREE +
Ashland Pump and Hay Tool Works.

The New York Safety Dumb Waiter.
"The Manhattan Dumb Waiter."
The Improved Humphrey Hand Elevator.
Made specially to be sold by Hardware Stores.
Thousands in use. Catalogues on application.
THE STORM MANUFACTURING CO.
NEWARK, NEW JERSEY.
Formerly of Poughkeepsie, New York.

PALMER'S PATENT HAMMOCKS.

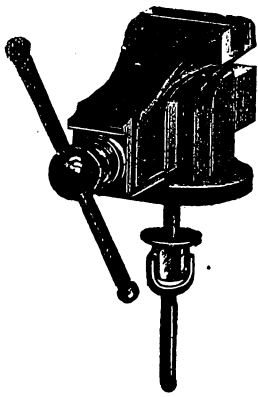


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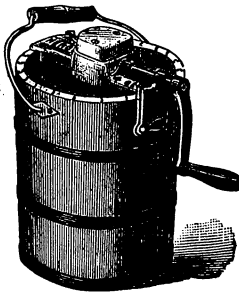




HOLLANDS' OFFSET JAW VISE.

Specially adapted for drill press work where chucks cannot be used and equally good for special or regular bench work.

Hollands Mfg. Co.,
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Manufacturers all
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"HERO" ICE CREAM FREEZER

Double Action.
2 qt. to 10 qt.

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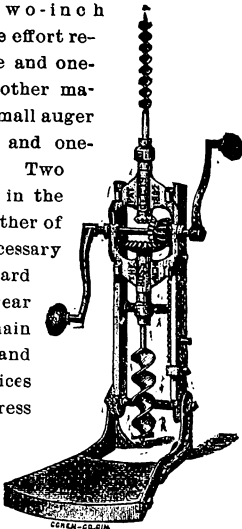
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"Rapid" Freezer
2 to 40 qt.

Clement & Dunbar,
1129 Beach St., Philadelphia.

The Boss 2-speed Boring Machine.

Will operate a two-inch auger with the same effort required in using one and one-half inch in any other machine, and for the small auger have a speed two and one-half times faster. Two augers may be kept in the machine, to use either of which it is only necessary to point it downward by first taking the gear frame out of main frame, inverting and replacing it. For prices and discounts address

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The Art of Selling

By F. B. GODDARD.

In this book the author lets the reader into the secrets of the accomplished and successful salesman, illustrates his tact and finesse and tells how he masters men. But beyond this, the work embraces much information which will be instructive and useful to all classes of business men, discusses fully the characteristic methods of conducting business to-day and makes an interesting application of character reading to the work of business negotiations

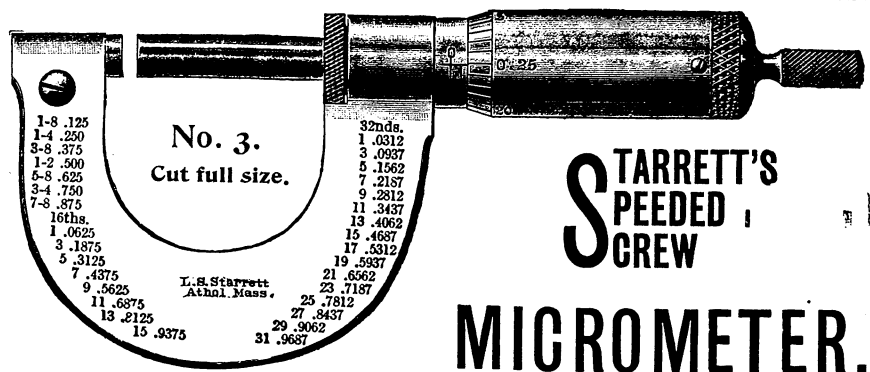
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DAVID WILLIAMS,

Publisher and Bookseller.

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STARRETT'S SPEEDED SCREW MICROMETER.

IMPROVEMENTS:

- 1 Quick opening and closing.
- 2 Closed barrel—dirt can't get in.
- 3 Reliable locking device.

Send for 80-Page Catalogue of Fine Mechanical Tools.

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Athol, Mass., U. S. A.

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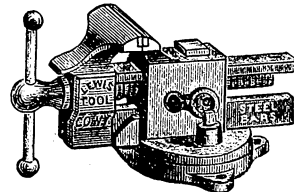
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Don't buy foreign goods, when you can buy a better article of domestic manufacture.

LUFKIN RULE CO., Saginaw, Mich.

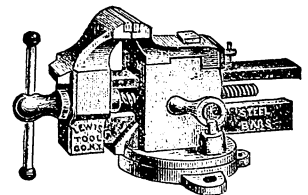
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LEWIS' PATENT DOUBLE STEEL SLIDE BAR VISES.



—FOR—
All Kinds of Vise
Work.

Send for Illustrated
Catalogue.

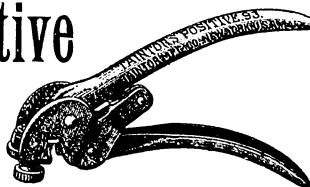


Lewis Tool Co., 44 Barclay St., New York.

WHAT MECHANICS THINK OF THE

Taintor Positive

Saw Set 93.



ANN ARBOR, MICH., May 5, '94.
I have given the Taintor Saw Set a thorough trial on both coarse and fine saws and find that it works like a charm. As you have named it "Positive," I think you struck the right name, for it is certainly a set that can't be beat.

Yours truly,
A. JONES.

MASON CITY, ILL., May 7, 1894.
I have given the Taintor Saw Set a good trial. I find it is perfect. It will do all your circulars claim for it. It sets a saw to perfection, and has no weak points about it. I can recommend it to all carpenters. They should add it to their kit of tools.

Yours very respectfully,
THOS. H. TACKLESON.

THE BRADY MANUFACTURING Co.,
Engineers and Contractors,
BROOKLYN, N. Y.,
Sept. 20, 1894.
TAINTOR MFG. Co., New York.
GENTLEMEN: It is my opinion that, everything considered, a better Saw Set than your 93 pattern will never be made.

JAMES BRADY, Manager.
SHAW, ORE., Sept. 10, 1894.
TAINTOR MFG. Co.
GENTS: I have given the Taintor Saw Set a good trial and found it perfect, and I recommended it to the carpenters here.

J. F. RIEGSECKER.

SPRINGFIELD, MASS.,
Oct. 3, 1894.

TAINTOR MFG. Co.
I have given the Set several trials, and especially on one saw that I could not set with a lever set. I had to take a strike set and go over it several times in order to get the desired set, but your Saw Set gives it the desired set to perfection, and I freely recommend it to mechanics who like to have an even and uniform set.

Respectfully yours,
J. W. FOSTER.

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OPERATING

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GENERAL OFFICE :

NEWARK, - - New Jersey,

SAWS

WENTWORTH'S PATENT NOISELESS SAW VISES, WITH RUBBER CUSHIONED JAWS.

Prevent all vibration and render Saw Filing noiseless.
Will make no more noise than Filing on a Solid Piece of Iron.

Have a Larger Sale than All Other Kinds Combined.

PRICE LIST.

No. 1 (11 inch Jaws),	-	\$15.00
No. 2 (15 inch Jaws),	-	21.00
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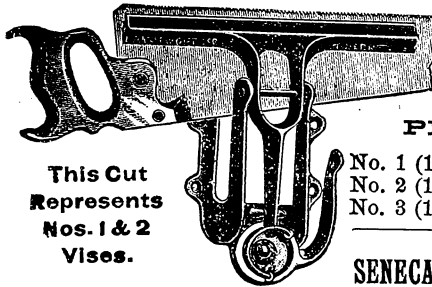
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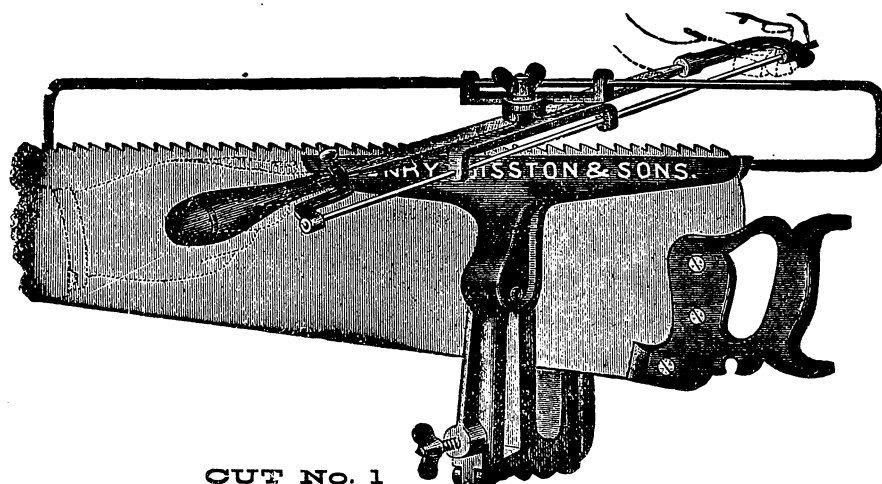
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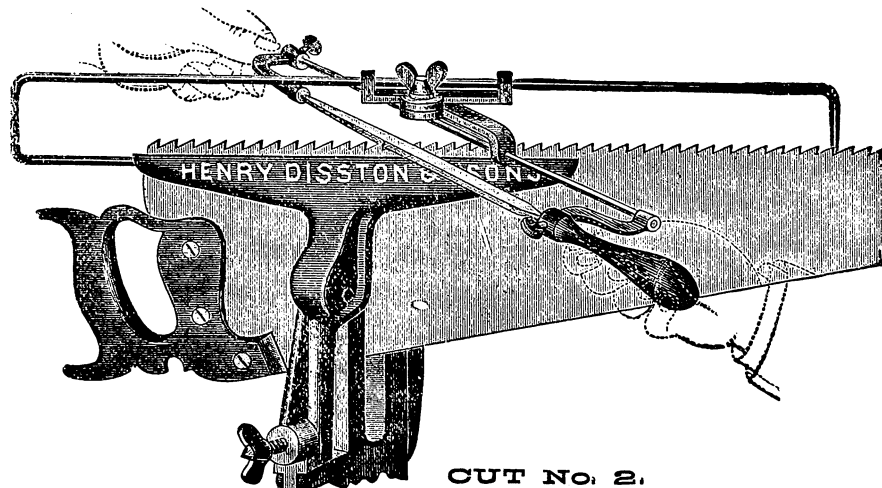
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ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART
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Cut No. 1 shows a saw and the attachment in proper position for filing the first side, and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.

To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

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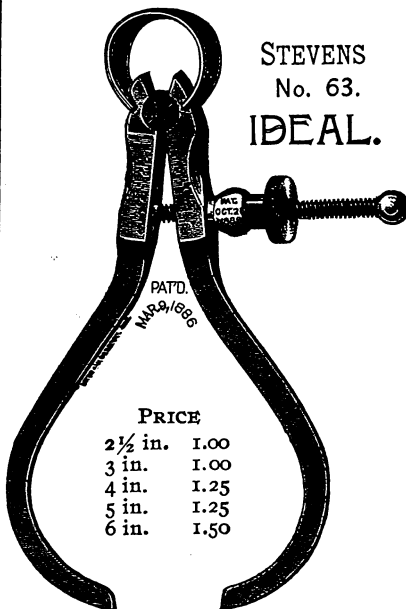
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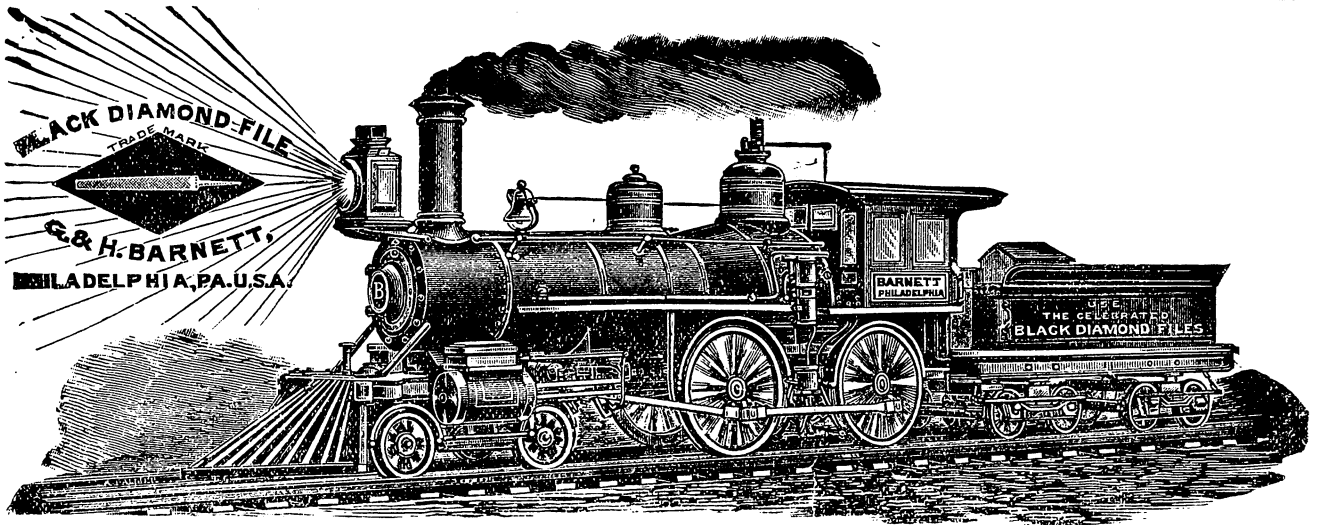
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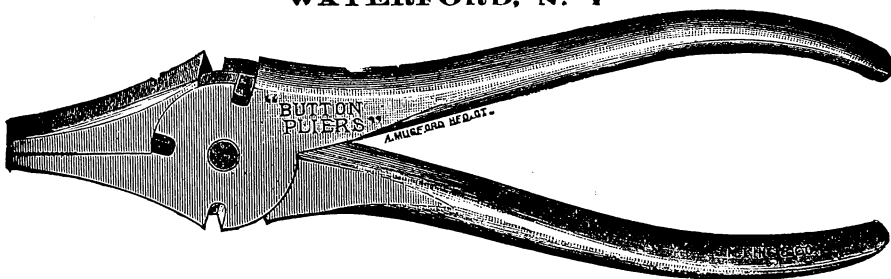
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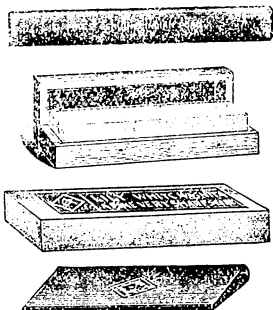
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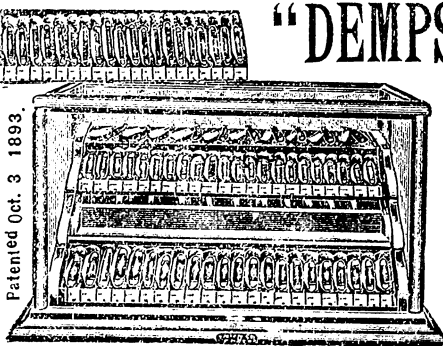
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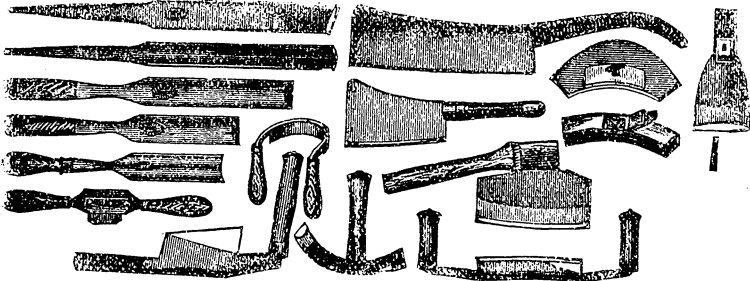
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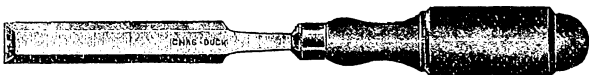
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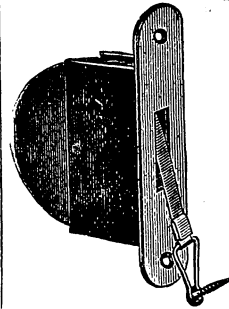
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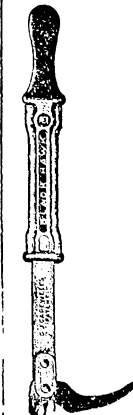
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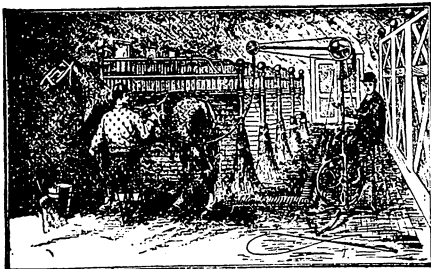
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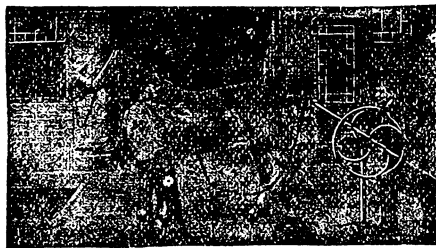
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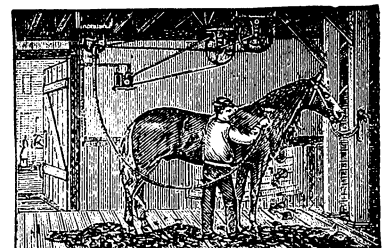
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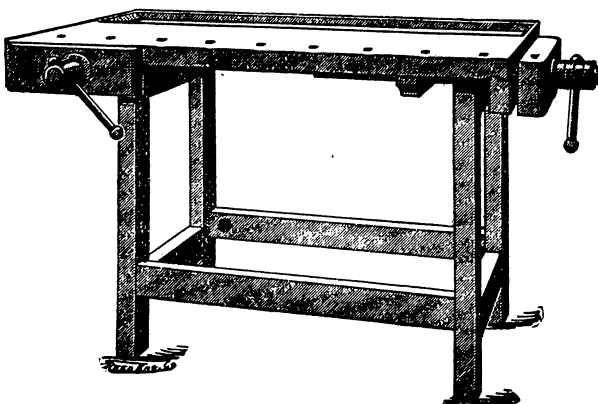
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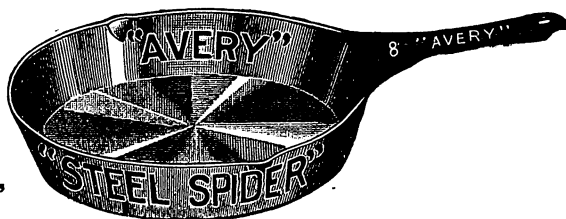
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This pair of Shears if stamped "Clauss, Fremont, O." is fully warranted. If not perfectly satisfactory return them to your Dealer and get a new pair.

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Fremont, O., U. S. A.,

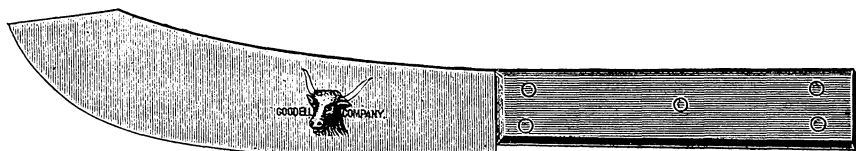
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Manufacturers of fine Shears, Scissors, Tinnets' Snips and The Celebrated Clauss Bread, Cake, Paring and the Perfect Carving Knives.

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Necessarily such a knife sells at a high price, but it is the cheapest in the end, and there is a good profit to dealer.

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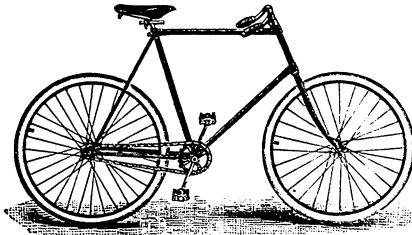
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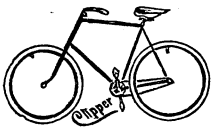
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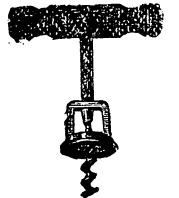
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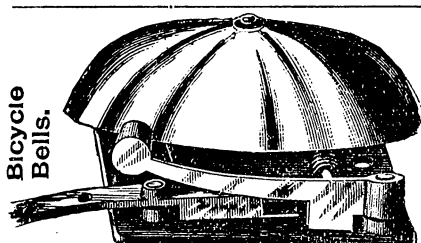
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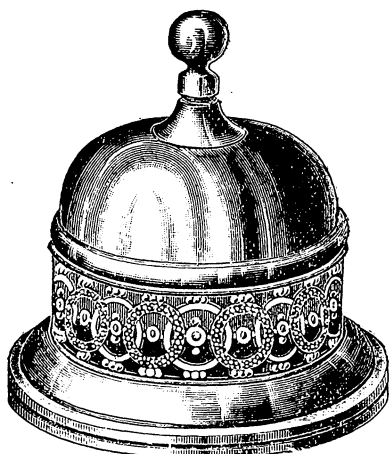
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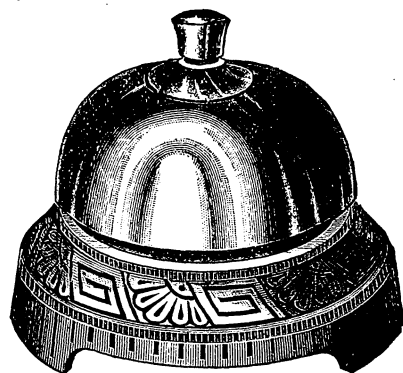
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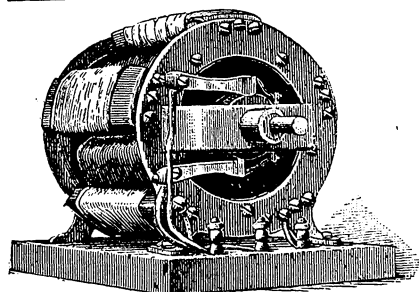
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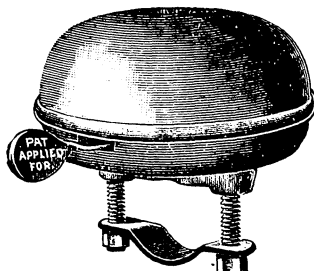
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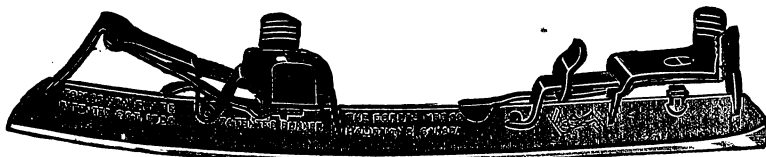
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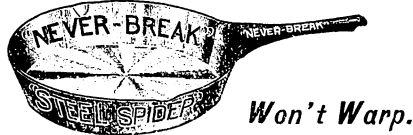
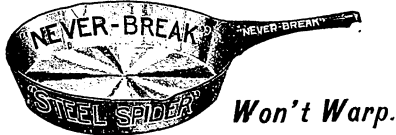
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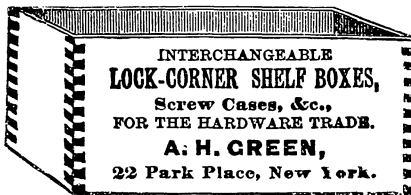
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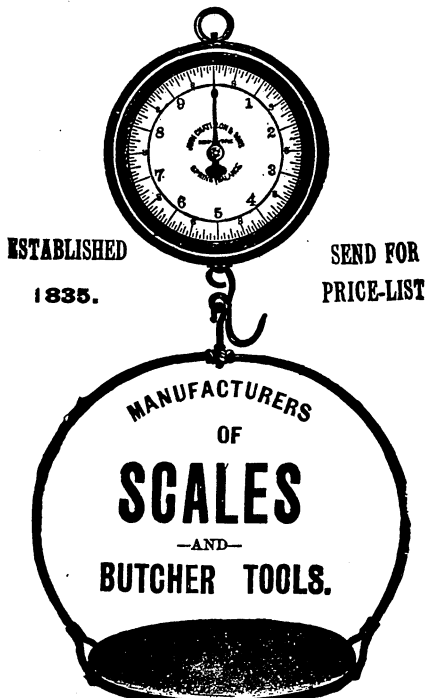
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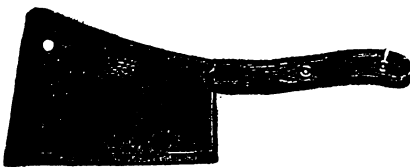


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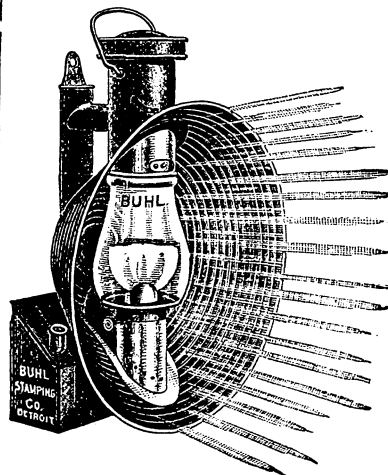
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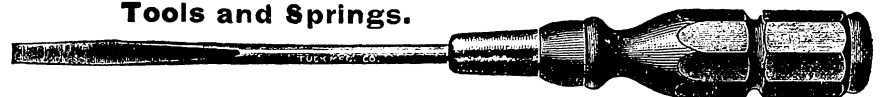
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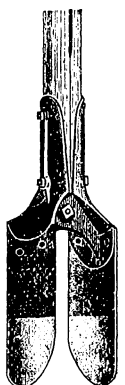
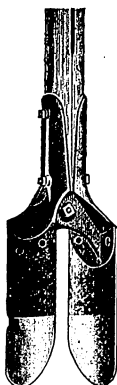
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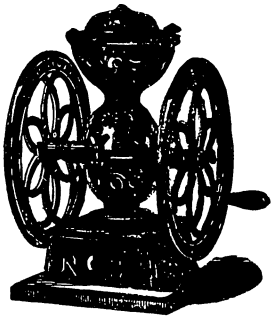


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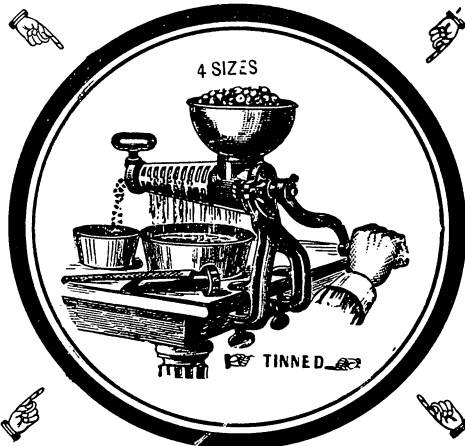
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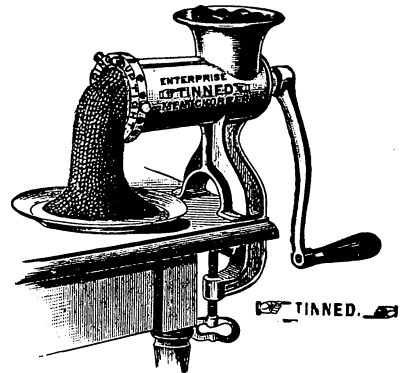
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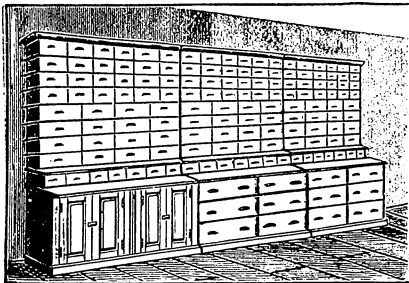
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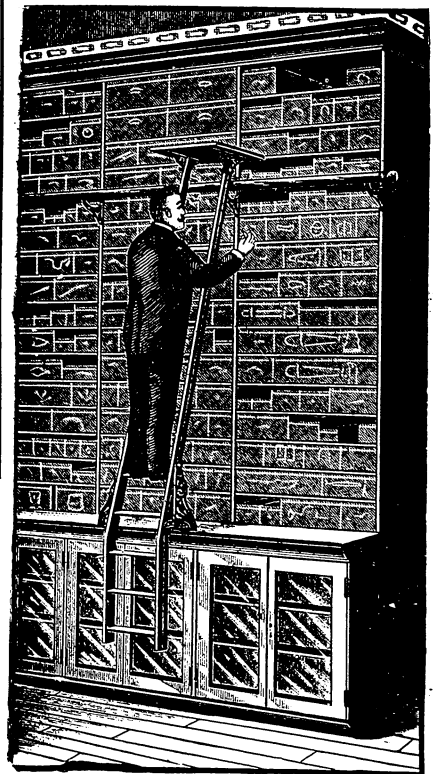
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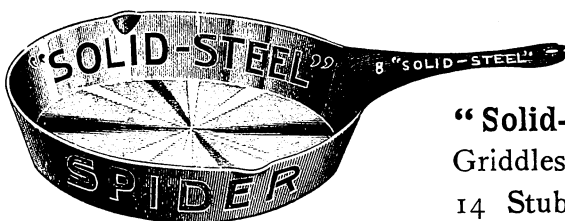
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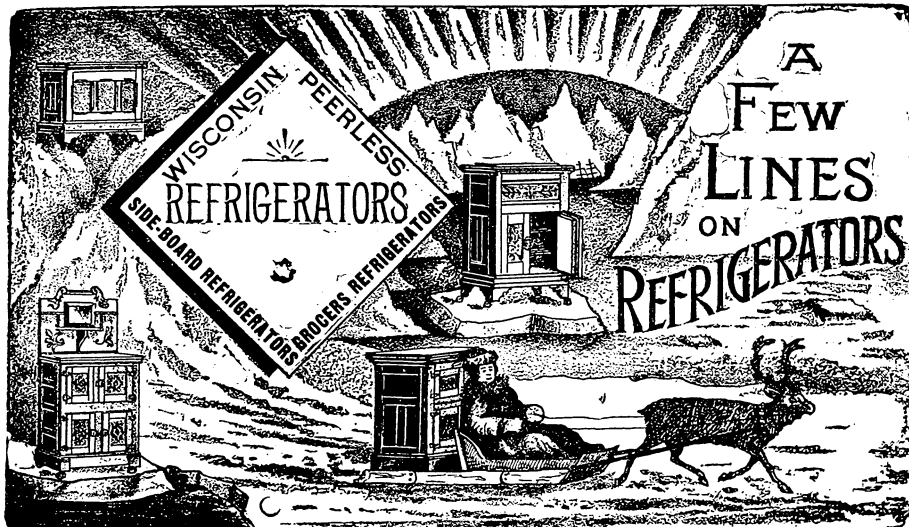
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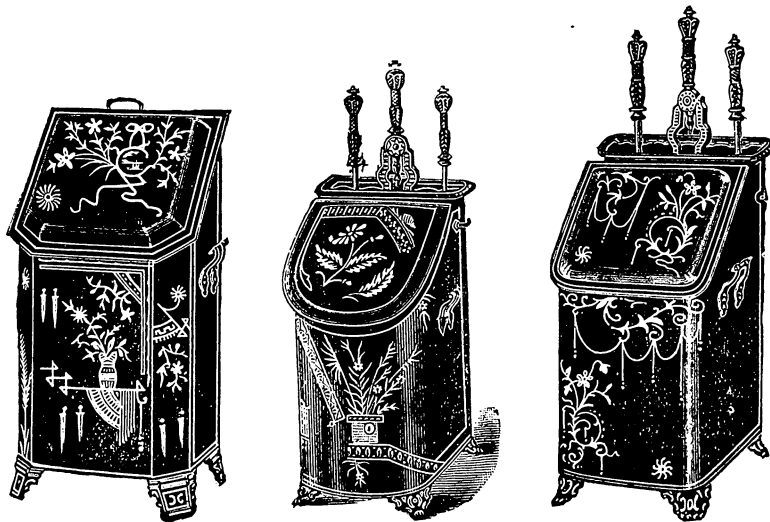
An address to the Institute of Accounts, New York, of which the writer is a member, put in form to assist those in charge of manufacturing accounts. Practical forms are included for a series of order books, examples of foreman's order, form of pay-roll, quarter-time book, job time book, form of summary, charges book, summary of costs, material, labor, cash, expense, manufacturing and improvement acts, store-room, iron foundry, brass foundry.

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"SENSIBLE" MINCING KNIVES.

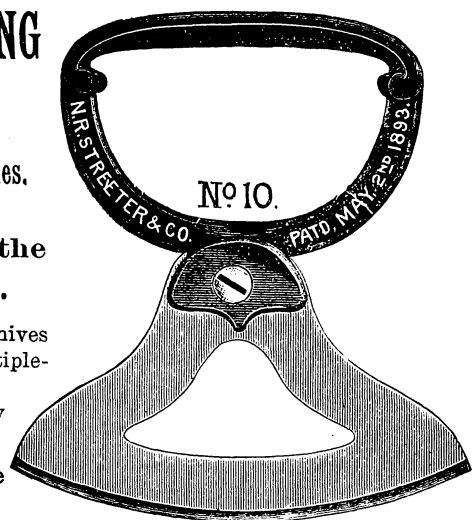
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Multiple-Bladed Means Rapid Cutting.

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BLADES can be REMOVED when they
need sharpening. Easy to clean.

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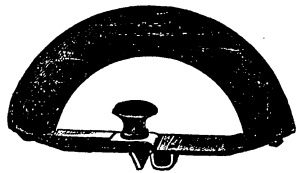
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N. Y. Office, W. H. JACOBUS, 90 Chambers St.

The Cleveland Wood Turning Co.,

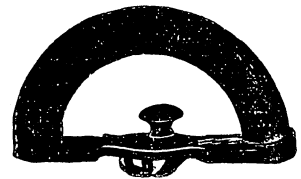
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Special work in Handles and Wood Turning of all
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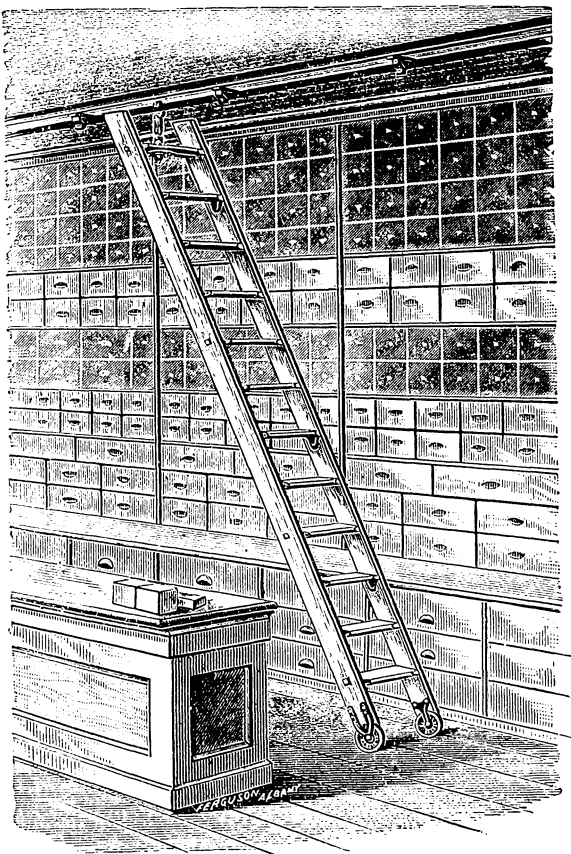
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No. 110.

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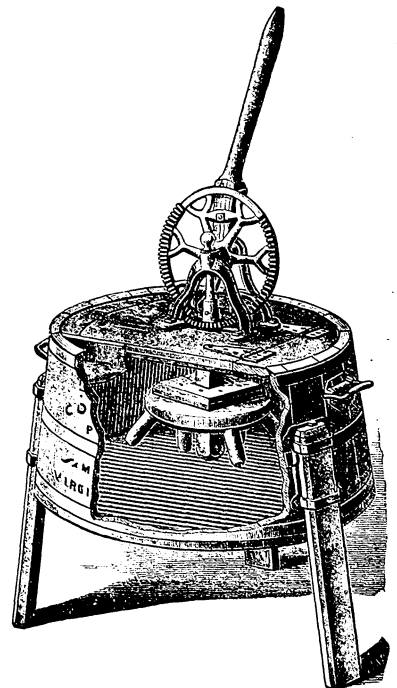
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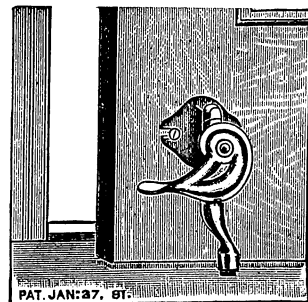
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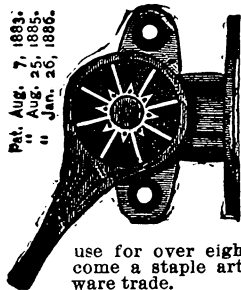
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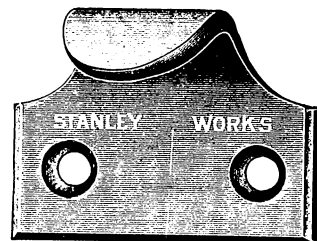
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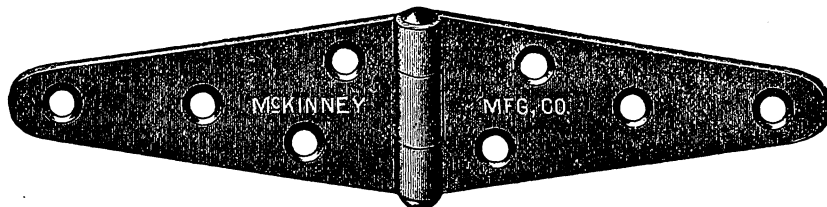
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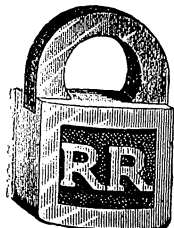
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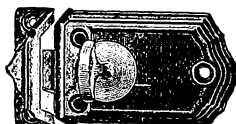


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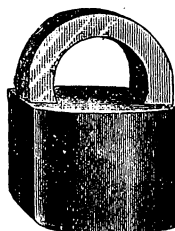
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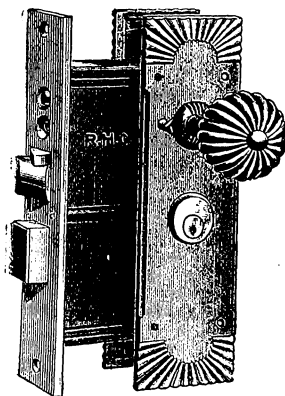
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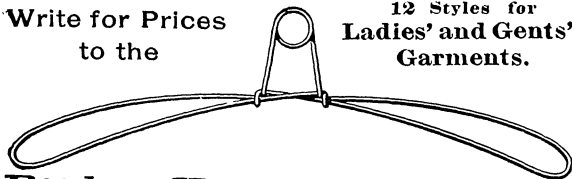
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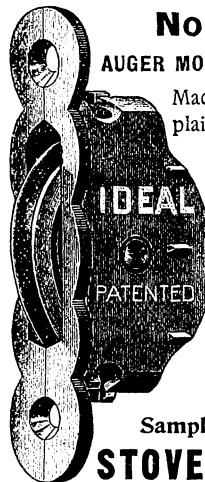
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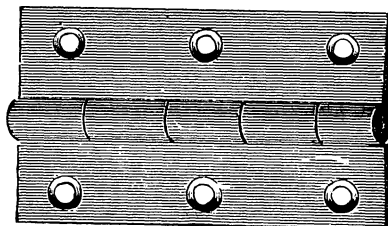
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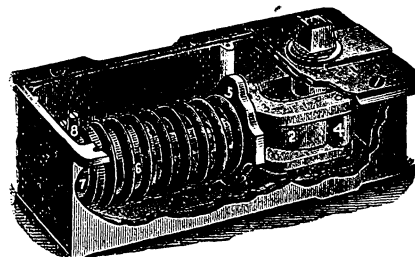
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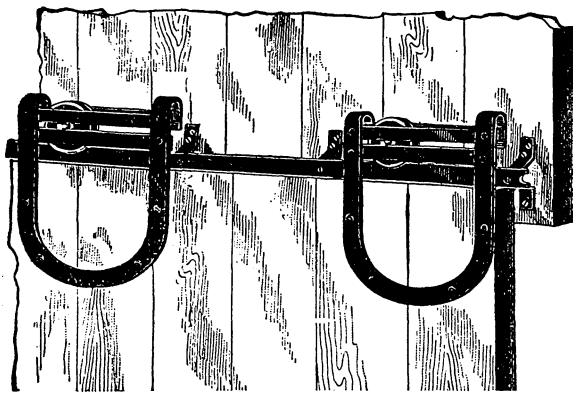
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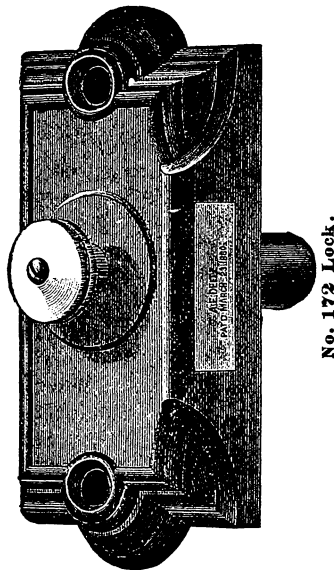
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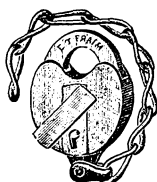
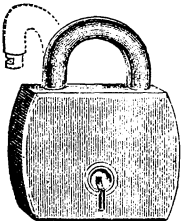


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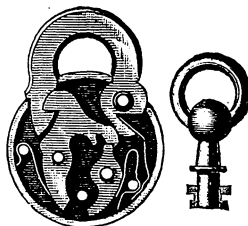
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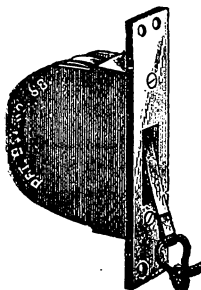
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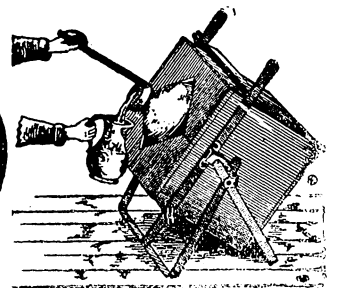
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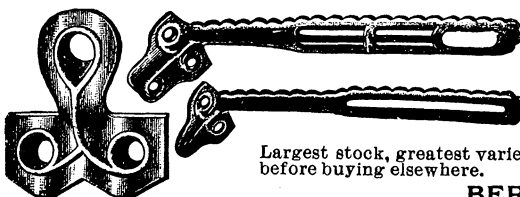
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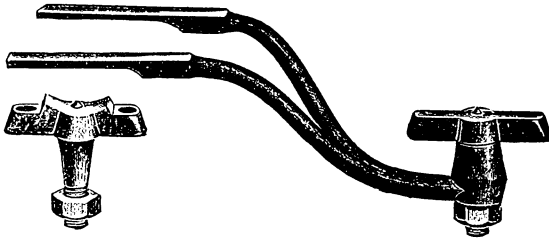


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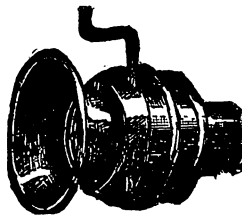
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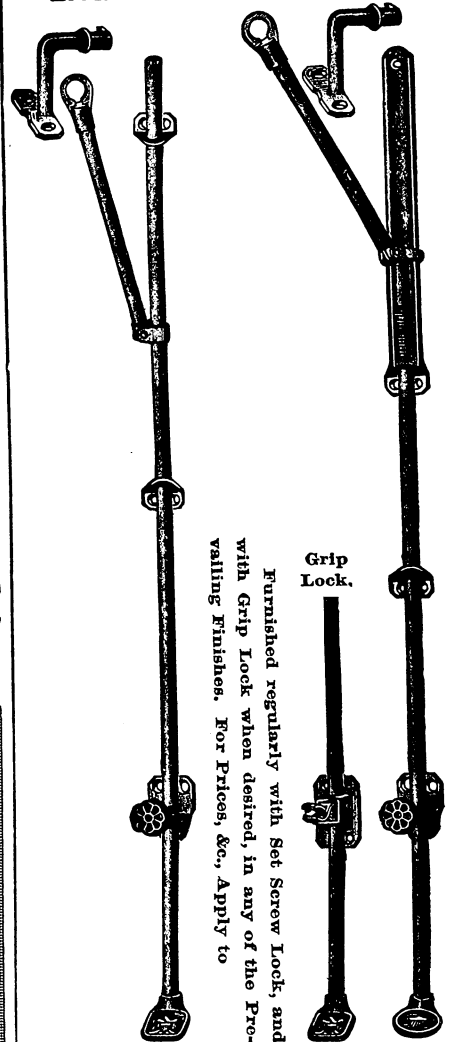
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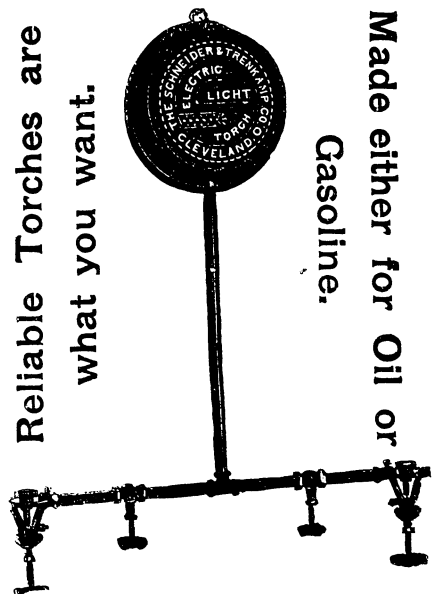


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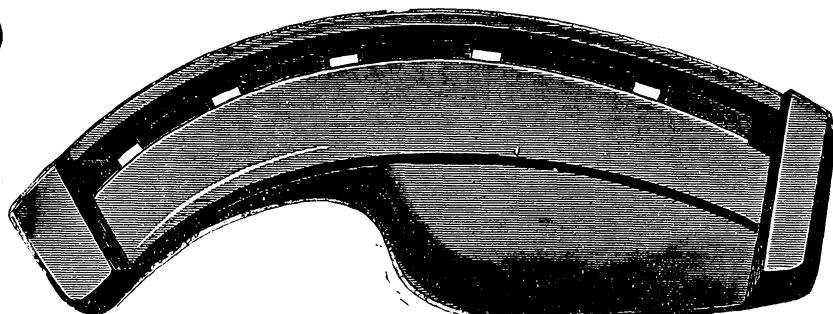
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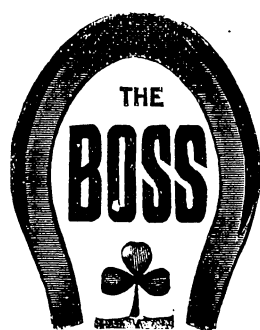
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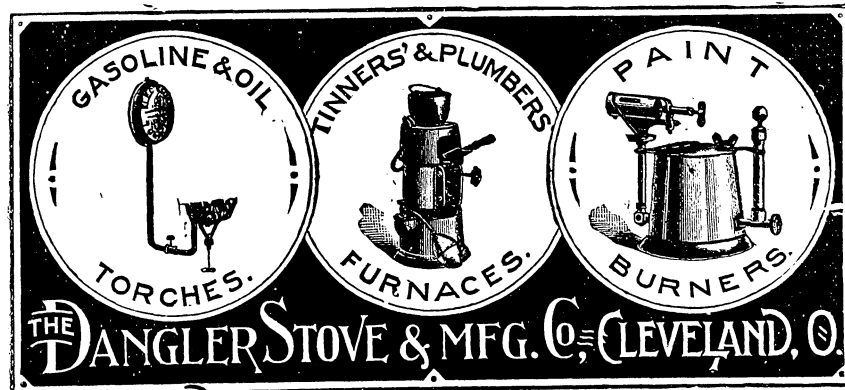
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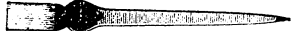


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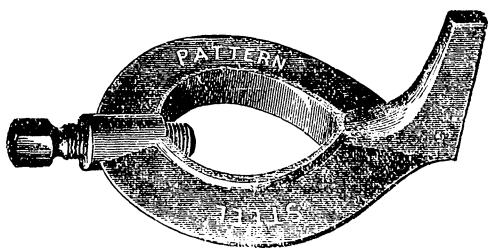
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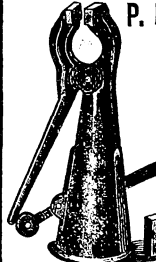
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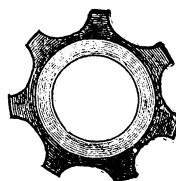
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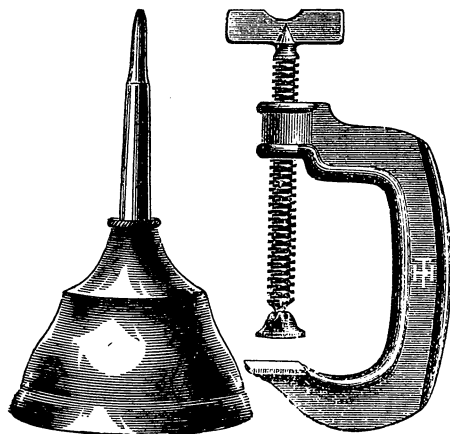
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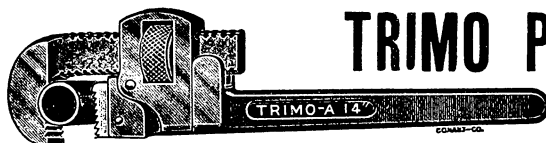
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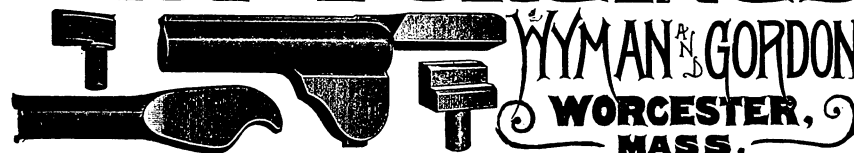
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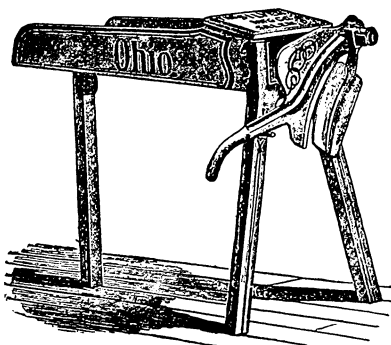
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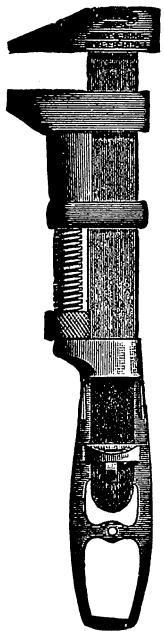
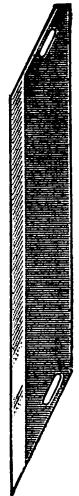
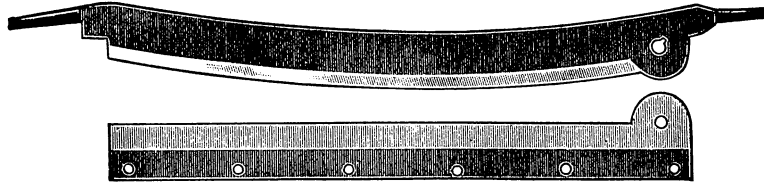
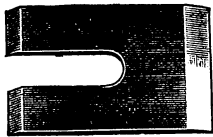
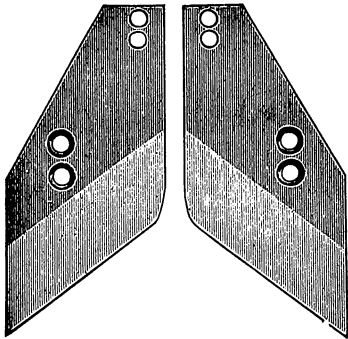
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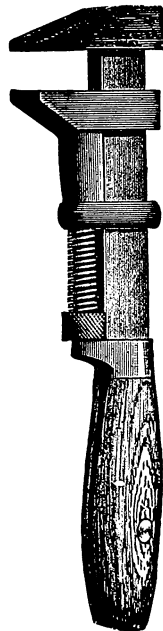
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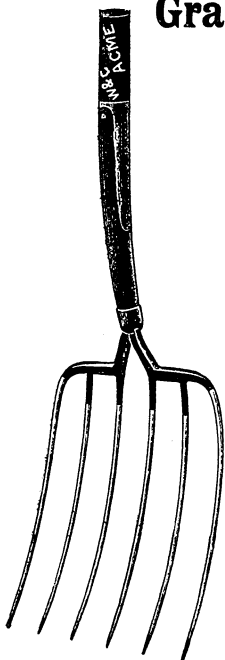
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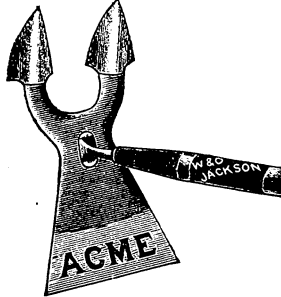
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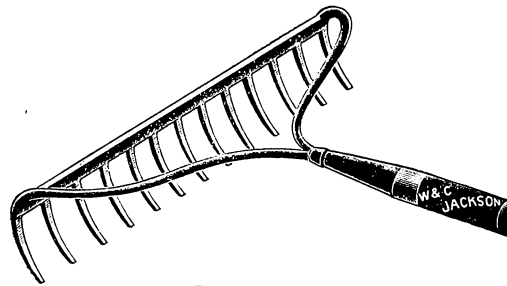
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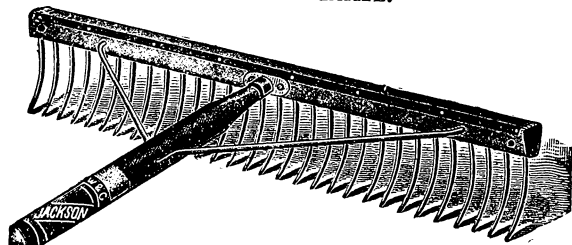
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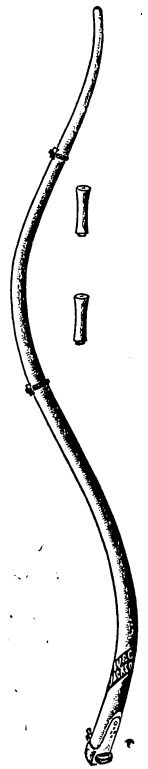
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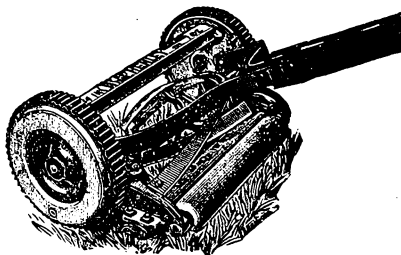
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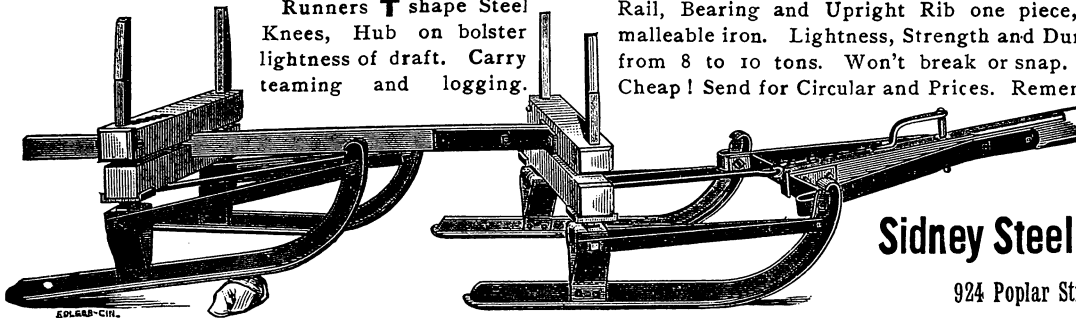
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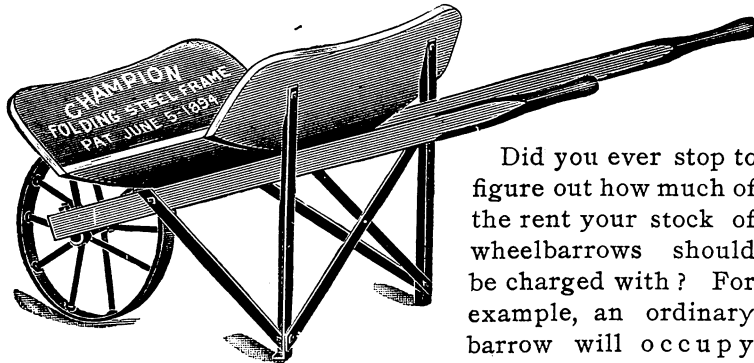
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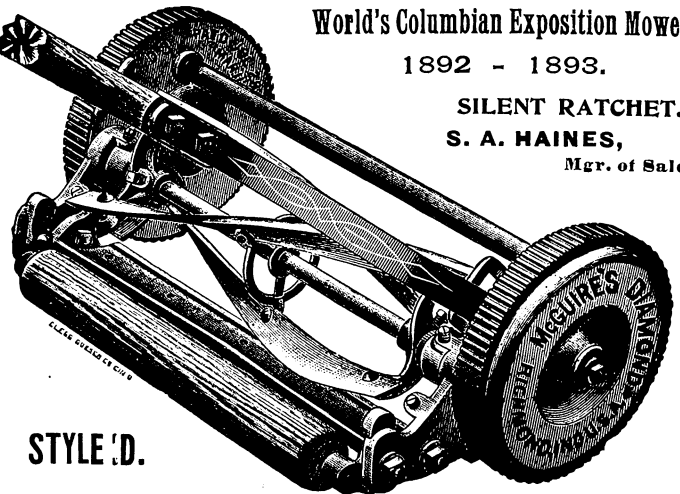
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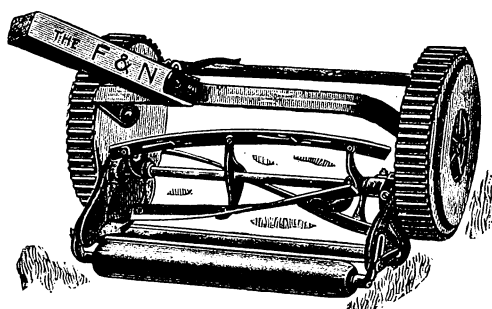
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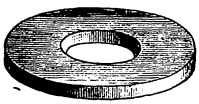
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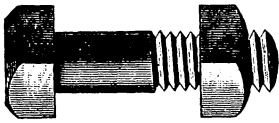
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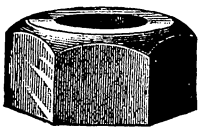
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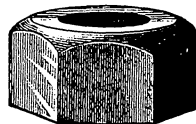


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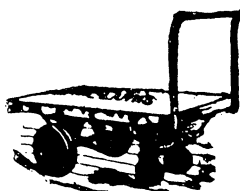
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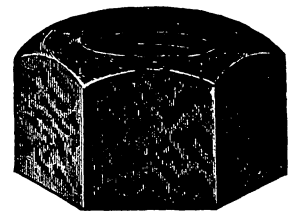
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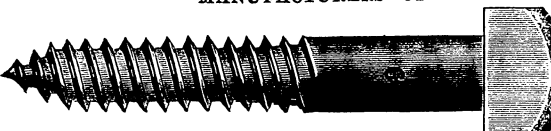
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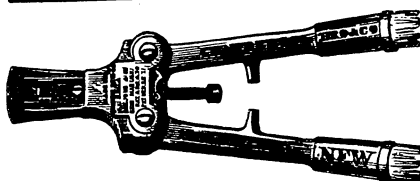
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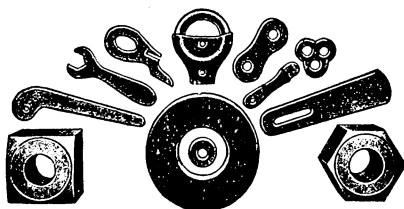
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- Hardware Jobbers.**
White, Van Glahn & Co., 15-17 Chatham Square, N. Y.
- Hardware Manufacturers.**
Allentown Hardware Works, Allentown, Pa.
Covert Mfg. Co., West Troy, N. Y.
Miller Falls Co., 93 Reed St., N. Y.
Parker, Chas. Co., Meriden, Conn.
Stearns, E. C. & Co., Syracuse, N. Y.
Streeter, N. R. & Co., Groton, N. Y.
Supplee Hdw. Co., Phila., Pa.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.
- Hardware Mfrs. Agents.**
Bingham, W. Co., Cleveland, O.
Graham, John H. & Co., 113 Chambers St., New York.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.
- Hardware Specialties.**
Acme Shear Co., Bridgeport, Conn.
Bergner Bros., Philadelphia, Pa.
Enterprise Mfg. Co., Philadelphia, Pa.
Johnson, S. C., Racine, Wis.
New Britain Hdw. Mfg. Co., New Britain, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Scranton & Co., New Haven, Conn.
Shepard, Sidney & Co., Buffalo, N. Y.
Union Lock & Hdw. Co., Lancaster, Pa.
Wilson, J. Fred., Worcester, Mass.
Wrightsville Hdw. Co., Wrightsville, Pa.
- Harness Snaps.**
Covert Mfg. Co., West Troy, N. Y.
Covets' Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.
- Hay Tools.**
Myers, F. E. & Bro., Ashland, O.
- Hoes.**
Withington & Cooley Mfg. Co., Jackson, Mich.
- Hoisting Machines.**
Box, Alfred & Co., 314 Green, Phila., Cleveland, Ohio.
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.
Byers, Jno. F. Mch. Co., Ravenna, O.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E. Son & Co., Phila.
Lidgerwood Mfg. Co., 96 Liberty, N. Y.
Lincoln Iron Works, Rutland, Vt.
McCoy, Jos. F. & Co., 28 Warren St.
Maris & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Spiegel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.
- Hollow Ware.**
Avery Stamping Co., Cleveland, O.
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
- Hollow Ware, Aluminum.**
Wohler Aluminum Co., Chicago, Ill.
- Horse Clippers.**
Gillette Clipping Machine Co., 201 E. 23d st., N. Y.
- Horse Nails, Makers of.**
Capewell Horse Nail Co., Hartford, Conn.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston, Mass.
- Horse and Mule Shoes, Makers of.**
Bryden Horse Shoe Co., Catsauqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Leonard, J., 446 West St., N. Y.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Stardard Horse Shoe Co., Boston, Mass.
- Hose.**
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.
- Hose Coupler.**
Adams & Westlake Co., Chicago, Ill.
- Hydrants, &c.**
McLean, John, 296 & 298 Monroe, N. Y.
- Hydraulic Forging.**
U. S. Projectile Co., Brooklyn, N. Y.
- Hydraulic Jacks.**
Dudgeon, Richard, 24 Columbia, N. Y.
McCoy, Jos. F. Co., 26 Warren St., N. Y.
- Ice Cream Freezers.**
Clement & Dunbar, Phila., Pa.
White Mountain Freezer Co., Nashua, N. H.
- Injectors.**
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York.
- Insurance, Boiler.**
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.
- Iron and Steel, Swedish.**
Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.
- Iron Commission Brokers.**
Butze, Adolph, St. Louis, Mo.
Cotton, Edw. & Co., 29 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Etting, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lea, J. Tatnall & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Wister, L. & R. Co., Phila., Pa.
- Iron Ore.**
Samuel, Frank, Philadelphia, Pa.
- Iron, Merchants.**
Barns, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Corning, Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Cunliffe, R. M., Phila., Pa.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 577 to 583 Greenwich St., N. Y.
- Pierison & Co., 29 Broadway, N. Y.**
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., 66 B'way, N. Y.
Whitney, A. E. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.
- Iron, Importers.**
Abbott, Wheelock & Co., N. Y. and Boston.
Lundberg, Gustaf, Boston, Mass.
- Iron, Sheet, Manufacturers of.**
Cambridge Iron & Steel Co., Cambridge, Ohio.
W. Dewees Wood Co., Lim., McKeesport, Pa.
- Ironwork, Ornamental.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
The Van Dorn Iron Works Co., Cleveland, O.
- Japanning.**
Smith, Theo. V., 54 John St., N. Y.
- Keys.**
Wollensak, J. F., Chicago, Ill.
- Knife and Tool Grinders.**
Tracy, A. J. Co., Ltd., 18 Cliff St., N. Y.
- Ladles.**
Whiting Fdy. Equipment Co., Chicago, Ill.
- Lanterns.**
Buhl Stamping Co., Detroit, Mich.
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Lasts.**
Kupferle, Jno. C., St. Louis, Mo.
- Lathes.**
Beaman & Smith, Providence, R. I.
Dietz, Schumacher & Co., Cincinnati, O.
Draper Machine Tool Co., Worcester, Mass.
Harrington, E. Son & Co., Phila., Pa.
Johnson, Israel H. Jr., & Co., Philadelphia, Pa.
Jones & Lamson Mch. Co., Springfield, Vt.
New Haven Mfg. Co., New Haven, Conn.
Rhodes, L. E. Co., Hartford, Conn.
Sebastian Lathe Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Lathing, Expanded Metal.**
Chess Bros., Pittsburgh, Pa.
- Lathing, Wire.**
Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Lawn Mowers.**
Blair Mfg. Co., Springfield, Mass.
Chadborn & Caldwell Mfg. Co., Newburgh, N. Y.
Coldwell Lawn Mower Co., Newburgh, N. Y.
Dille & McGuire Mfg. Co., Richmond, Ind.
F. & N. Mfg. Co., Richmond, Ind.
Henley, M. C., Richmond, Ind.
Stearns, E. C. & Co., Syracuse, N. Y.
- Lawn Rakes.**
Gibbs Mfg. Co., Canton, Ohio.
Kohler, F. E. & Co., Canton, O.
- Lawn Sprinklers.**
Blair Mfg. Co., Springfield, Mass.
McGowan, John H. Co., Cincinnati, O.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
- Letters and Figures, Metallic.**
White, A. A. & Co., Providence, R. I.
- Letters, Paper.**
Tablet & Ticket Co., Chicago, Ill.
- Levels.**
Richardson, C. F. & Son, Athol, Mass.
- Locks and Knobs, Manufacturers of.**
Deitz, A. E., 97 Chambers, N. Y.
Reading Hdw. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Yale & Towne Mfg. Co., Stamford, Conn.
- Lubricants.**
Dixon, Jos., Crucible Co., Jersey City, N. J.
- Machinery.**
Am. Tool Works, Cleveland, Ohio.
Ayer, H. C. & Gleason Co., Phila., Pa.
Barnes, W. F. & John, Rockford, Ill.
Beaman & Smith, Providence, R. I.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 Dey, N. Y.
Bisnall & Keeler Mfg. Co., St. Louis.
Bliss, E. W. Co., Brooklyn, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Bullard Mch. Tool Co., Bridgeport, Conn.
Carlin's Sons, Thos., Allegheny, Pa.
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
Cross & Speirs Mch. Co., Waterbury, Conn.
Detrick & Harvey Mch. Co., Baltimore, Md.
Dietz, Schumacher & Co., Cincinnati, Ohio.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Light & Canal Sts.
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila., Pa.
Hartford Machine Screw Co., Hartford, Conn.
Hendey Machine Co., Torrington, Ct.
Ell, Clarke & Co., Boston, Mass.
Howard & Morse, 45 Fulton St., N. Y.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt.
Lodge & Davis Mch. Tool Co., Cincinnati, O.
Lodge & Shipley Mch. Tool Co., Cincinnati, O.
McCabe, J. J., 68 Cortlandt, N. Y.
Mechanists' Supply Co., Rochester, N. Y.
Manville, E. J., Mch. Co., Waterbury, Conn.
Newark Mch. Tool Wks., Newark, N. J.
New Haven Mfg. Co., New Haven, Ct.
New York Machinery Depot, 178 Broadway, New York.
Niles Tool Wks., 138 Liberty St., N. Y.
Pittsburgh Mfg. Co., Pittsburgh, Pa.

- Places, Geo., 145 Broadway, N. Y.**
Pond, L. W. Mch. Co., Worcester, Mass.
Poole, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.
Prentiss Tool & Supply Co., N. Y.
Scranton Supply & Mchry. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons, L. F., Philadelphia, Pa.
Sigourney Tool Co., Hartford, Conn.
Stephoe, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Ltd., Phila.
Toomey, Frank, Philadelphia, Pa.
Walker Mfg. Co., Cleveland, O.
Wetherill, Robert & Co., Chester, Pa.
Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacturers.**
 Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**
 Loring Coes & Co., Worcester, Mass.
 Simonds Mfg. Co., Fitchburg, Mass.
- Machine Screws.**
 American Iron & Bolt Co., Cincinnati, Ohio.
 Rubbell, Harvey, Bridgeport, Ct.
 New Britain Hdw. Mfg. Co., New Britain, Conn.
 Rhode Island Tool Co., Providence, R.I.
- Machine Tools.—See Machinery.**
- Machinists Scales.**
 Coffin & Leighton, Syracuse, N. Y.
 Starrett, L. S. Co., Athol, Mass.
- Machinists' Tools and Supplies.**
 King, J. M. & Co., Watford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.
- Manufacturing Sites.**
 Chicago, Milwaukee & St. Paul R. Co., Chicago, Ill.
- Measuring Tapes.**
 Lufkin Rule Co., Saginaw, Mich.
- Meat Choppers.**
 Enterprise Mfg. Co., Philadelphia, Pa.
- Meat Cutters.**
 North Bros. Mfg. Co., Philadelphia, Pa.
- Mechanical Instruction.**
 Correspondence School of Mechanics, Scranton, Pa.
- Metals.**
 Fearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**
 American Metal Co., N. Y.
- Metal Saws.**
 Q. & C. Co., Chicago, Ill.
- Metallurgists.**
 Britton, J. Blodgett, Phila., Pa.
- Mincing Knives.**
 Palmer Hdw. Mfg. Co., Troy, N. Y.
 Streeter, N. R. & Co., Groton, N. Y.
- Mine Lamps.**
 Darby, Edw. & Sons, Phila., Pa.
 Leonard, B. E., Scranton, Pa.
 Snyder, J. L., Plymouth, Pa.
- Mining Screens.**
 Harrington & King Perforating Co., Chicago, Ill.
 Howard & Morse, 45 Fulton, N. Y.
- Mining Machinery.**
 Allis, E. P. Co., Milwaukee, Wis.
- Models, Makers of.**
 Ideal Machine Works, Hartford, Conn.
- Molding Sand.**
 Obermayer, S. Co., Cincinnati, O.
- Motors, Water and Electric.**
 C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
 Dallett, Thomas H. & Co., Phila., Pa.
- Nail Machinery.**
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Tack Pullers.**
 Am. Specialty Co., Hartford, Conn.
 Scranton & Co., New Haven, Conn.
- Nails (Cut) and Spikes.**
 Borden & Lovell, 70 West, N. Y.
 Pottstown Iron Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.
- Norway Shapes, Rollers of.**
 Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**
 Ideal Machine Works, Hartford, Conn.
- Nut Machines.**
 Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
 American Bolt & Nut Co., Lowell, Mass.
 American Iron & Bolt Co., Cincinnati, Ohio.
 American Screw Co., Providence, R.I.
 Blake & Johnson, Waterbury, Conn.
 Dunham Nut Co., Unionville, Conn.
 Haskell, Wm. H. Co., Pawtucket, R.I.
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.
 Port Chester Bolt & Nut Co., Port Chester, N. Y.
 Rhode Island Tool Co., Providence, R.I.
 Russell, Burdall & Ward, Port Chester, N. Y.
 Sternbergh, J. H. & Son, Reading, Pa.
 Wilson, J. Fred., Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R.I.
- Oilers.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oilless Anti-Friction Metals.**
 North American Metalline Co., Long Island City, N. Y.
- Oil Cans.**
 Bloomsburg Mfg. Co., Bloomsburg, Pa.
- Oil Stones.**
 Pike Mfg. Co., Pike Station, N. H.
- Ores.**
 Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**
 Scranton Forging Co., Scranton, Pa.
- Packing.**
 Morrison, Robert, St. Louis, Mo.
 N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**
 Ames Sword Co., Chicopee, Mass.
 Fraim, E. T., Lancaster, Pa.
 Union Lock & Hdw. Co., Lancaster, Pa.
 Wolf, W. & L., Phila., Pa.
- Pails.**
 Richmond Cedar Wks., Richmond, Va.
- Paint Burners.**
 Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretcher.**
 Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**
 Butler, C. N., Phila., Pa.
 Jenner, H. W. T., Washington, D. C.
 Howson & Howson, Philadelphia and Washington.
 Stocking, E. B., Washington, D. C.
- Pattern Letters.**
 Wells, Heber, 167 William St., N. Y.
- Perforated Metal.**
 Clinton Wire Cloth Co., Clinton, Mass.
 Harrington & King Perforating Co., Chicago, Ill.
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**
 Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**
 Crescent Phosphorized Metal Co., Philadelphia, Pa.
 Halk & Naumann, 516 Pearl, N. Y.
- Pig Iron.**
 Houston, C. B. & Co., Philadelphia, Pa.
 Monfour Iron & Steel Co., Danville, Pa.
 Naylor & Co., 45 Wall, N. Y.
 Pilling & Crane, Philadelphia, Pa.
 Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
 Am. Pig Iron Storage Warehouse Co., 44 Wall, N. Y.
- Pile Drivers.**
 Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**
 National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**
 Armstrong Mfg. Co., Bridgeport, Conn.
 Bignall & Keeler Mfg. Co., St. Louis, Mo.
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Merrill Mfg. Co., Toledo, O.
 Pencoast, Henry B. & Co., Phila.
 Saunders' Sons, D., Yonkers, N. Y.
 Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**
 Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
 McNab & Harlin Mfg. Co., N. Y.
- Pipe, Sewer.**
 Columbus Sewer Pipe Co., Columbus, Ohio
- Pipe, Water and Gas, Makers of.**
 Donaldson Iron Co., Emaus, Pa.
 Riverside Iron Works, Wheeling, W. Va.
 Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**
 Buck Bros., Millbury, Mass.
 Buck, Chas., Millbury, Mass.
- Planers.**
 Detrick & Harvey Mch. Co., Baltimore, Md.
 New Haven Mfg. Co., New Haven, Conn.
 Pond, L. W. Mch. Co., Worcester, Mass.
 Powell Planer Co., Worcester, Mass.
 Wilson, W. A., Worcester, Mass.
- Planes, Manufacturers of.**
 Stanley Rule & Level Co., N. Y.
- Plated Ware.**
 Boardman L. & Son, New Haddam, Ct.
 Holmes & Edwards Silver Co., Bridgeport, Conn.
 Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**
 Ed-Standard Iron & Steel Co., Bridgeport, O.
 Lukens & Steel Co., Coatesville, Pa.
 Mahoning Valley Iron Co., Youngstown, Ohio.
 Moorhead-McLean Co., Pittsburgh, Pa.
 McIlvain & Sons, Reading, Pa.
 Pottstown Iron Co., Pottstown, Pa.
 Pottsville Iron & Steel Co., Pottsville, Pa.
 Singer, Nimick & Co., Pittsburgh, Pa.
 The Mahoning Valley Iron Co., Youngstown, O.
 Wood, Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Polishing Machines.**
 Watson & Stillman, 204 E. 43d, N. Y.
- Post Hole Diggers.**
 Gibbs Mfg. Co., Canton, Ohio.
 Kohler, F. E. & Co., Canton, O.
- Poultry Nettings.**
 Barnum, E. T., Detroit, Mich.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
 N. J. Wire Cloth Co., Trenton, N. J.
 "Silver Finish."
 Tyler Wire Works Co., W. S., Cleveland, O.
 Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**
 Laffin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.
- Power Hammers.**
 Dienelt & Eisenhardt, Philadelphia.
 Dupont Mfg. Co., St. Johnsbury, Vt.
 Jenkins & Lingle, Bellefonte, Pa.
 Long & Allstatter Co., Hamilton, Ohio.
 Miner & Peck Mfg. Co., New Haven, Conn.
 Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**
 Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Mch. Co., Waterbury Ct.
- Presses, Power, Makers of.**
 Bliss, E. W. Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Merriman, A. H., Meriden, Conn.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Printing and Embossing.**
 Griffith, Axtell & Cady Co., Holyoke, Mass.
- Pruners.**
 Toplift & Ely Co., Elyria, Ohio.
- Pulleys.**
 Brown, A. & F., 17 Dey St., N. Y.
 Dodge Mfg. Co., Mishawaka, Ind.
 Keystone Clutch Mch. Wks., Phila., Pa.
 Reading Wood Pulley Co., Reading, Pa.
- Pumping Machinery.**
 Dean Bros. Steam Pump Works, Indianapolis, Ind.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Hooker-Corville Steam Pump Co., St. Louis, Mo.
 McGowan, J. H. & Co., Cincinnati, O.
 Maslin, J. & Son, Jersey City, N. J.
 Norwalk Iron Works Co., So. Norwalk, Conn.
 Southwark Fdy. & Mch. Co., Phila., Pa.
 Valley Pump Works, Easthampton, Mass.
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.
- Pump Leathers.**
 Detroit Valve & Washer Co., Detroit, Mich.
- Pumps, Makers of.**
 Deming Co., Salem, O.
 Douglas, W. & B., Middletown, Conn.
 Goulds Mfg. Co., Seneca Falls, N. Y.
 Myers, F. E. & Bro., Ashland, O.
- Punches.**
 Richards, I. P., Providence, R. I.
- Punches and Shears, Hand and Power.**
 E. W. Bliss Co., Brooklyn, N. Y.
 Butts & Ordway, Boston, Mass.
 Crosby, G. A. & Co., Chicago, Ill.
 Long & Allstatter Co., Hamilton, Ohio.
 Stiles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
 Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**
 Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**
 Estey, W. S., 65 Fulton, N. Y.
 Excelsior Cutlery Co., Worcester, Mass.
- Razors, Manufacturers of.**
 Millbury Razor Co., Millbury, Mass.
- Reducing Valves.**
 D'Este & Seeley Co., Boston, Mass.
- Keels.**
 Hendryx, A. B. Co., New Haven, Conn.
- Refrigerators.**
 Wisconsin Refrigerator Co., Eau Claire, Wis.
- Rivers.**
 Blake & Johnson, Waterbury, Conn.
 Ruger Iron Co., Troy, N. Y.
 Cobb & Drew, Plymouth, Mass.
 Dover Iron Co. of N. J., Dover, N. J.
 Sternbergh, J. B. & Son, Reading, Pa.
 Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**
 Adt, Jno. & Sons, New Haven, Conn.
- Rolling Mill Machinery.**
 Birmingham Iron F'dry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 Leeburg Foundry & Mch. Co., Pittsburgh, Pa.
 Morgan Construction Co., Worcester, Mass.
 Robinson-Rea Mfg. Co., Pittsburgh.
 Totten & Hogg Iron and Steel F'dry Co., Pittsburgh.
 Trothewey Mfg. Co., Pittsburgh, Pa.
 Waterbury Farrel Foundry & Mch. Co., Waterbury Conn.
- Rolls, Chilled, Sand and Steel.**
Birmingham Iron Foundry, Birmingham, Conn.
 Booth, The Lloyd Co., Youngstown, O.
 East Chicago F'dry Co., Chicago, Ill.
 Garrison, A. F'dry Co., Pittsburgh, Pa.
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.
 Seaman, Steeth Black, Pittsburgh.
 Totten & Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.
- Roofing.**
 Cincinnati Corrugating Co., Piqua, O.
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Rope and Web Goods.**
 Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**
 Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**
 Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
 Stanley Rule & Level Co., 29 Chambers, Stephens & Co., Riverton, Conn.
- Sad Irons.**
 Enterprise Mfg. Co., Phila., Pa.
 Streeter, N. R. & Co., Groton, N. Y.
- Sand Paper.**
 Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
 Caldwell Mfg. Co., Rochester, N. Y.
 Pullman Sash Balance Co., Rochester, N. Y.
- Sash Cords and Chains.**
 Morton, Thos., 65 Elizabeth, N. Y.
 Samson Cordage Works, Boston, Mass.
 Smith & Egge Mfg. Co., Bridgeport.
- Sash Lifts.**
 Stanley Works, New Britain, Conn.
- Sash Locks.**
 Champion Safety Lock Co., Cleveland, Ohio.
- Sash Pulleys.**
 Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
 Brown, E. E. & Co., Philadelphia, Pa.
 Kings County Iron Foundry, Brooklyn, N. Y.
 Norton Bros., Chicago, Ill.
- Saw Filing Machines.**
 Diston, Henry & Sons, Philadelphia, Pa.
- Saws, Makers of.**
 Atkins, E. C. & Co., Indianapolis, Ind.
 Disston, Henry & Sons, Phila., Pa.
 National Saw Co., Newark, N. J.
 Simonds Mfg. Co., Fitchburg, Mass.
- Saw Sets.**
 Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Saw Vises.**
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Sawing Machines.**
 Q. & C. Co., Chicago, Ill.
- Scales, Manufacturers of.**
 Buffalo Scale Co., Buffalo, N. Y.
 Chatillon, John & Sons, 85-89 Cliff, N. Y.
 Standard Scale & Fixtures Co., St. Louis, Mo.
- Scrapers, Road.**
 Sidney Steel Scraper Co., Sidney, O.
- Screens, Coal and Ore.**
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screw Cutting Machinery.**
 Wells Bros. & Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
 Brown, R. H. & Co., New Haven, Conn.
 Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Machinery.**
 Hartford Machine Screw Co., Hartford, Conn.
- Screw Plate and Pipe Cutter.**
 Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
 American Screw Co., Providence, R.I.
 Blake & Johnson, Waterbury, Conn.
 Wm. H. Haskell Co., Pawtucket, Miles, F. S., 205 Quarry, Philadelphia, Phila. Mach. Screw Works, Phila., Pa.
 Reynolds & Co., New Haven, Conn.
 Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**
 Barnes, W. F. & John, Rockford, Ill.
 Millers Falls Co., 93 Reade St., N. Y.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Scythe Stones and Whetstones.**
 Pike Mfg. Co., Pike Station, N. H.
 Cleveland Stone Co., Cleveland, O.
- Shafting, Makers of.**
 Brown, A. & F., 17 Dey St., N. Y.
 Cresson, Geo. V. Co., Philadelphia, Pa.
 Fairmount Mch. Co., Philadelphia, Pa.
 Sellers, Wm. & Co., Inc., Phila., Pa.
 Stow Mfg. Co., Binghamton, N. Y.
- Shaped Iron and Steel, Manufacturers of.**
 Atma-Standard Iron & Steel Co., Bridgeport, O.
 East Chicago F'dry Co., Chicago, Ill.

- Allentown Rolling Mill, Allentown, Pa.**
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
The Phoenix Iron Co., Phila., Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
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- Shears and Scissors.**
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- Sheet Iron and Steel, Manufacturers of.**
Atna-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Jersey City Galvanizing Co., 112 John St., N. Y.
Mahoning Valley Iron Co., Livingston, Ohio.
Morehead-McCleane Co., Pittsburgh, Pa.
Pierston & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Metal Goods.**
Bloomsburg Mfg. Co., Bloomsburg, Pa.
- Sheet Zinc.**
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**
Atlas Mfg. Co., New Haven, Conn.
- Shoe Stands.**
Kupferle, Jno. C., St. Louis, Mo.
- Show Cases.**
Union Show Case Co., Chicago, Ill.
- Slabs.**
Douglas, W. & B., Middletown, Conn.
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Perkins, Chas., Bridgewater, Mass.
- Skates, Ice.**
Dane, Stoddard & Kendall, Boston, Mass.
Keene Mfg. Co., Keene, N. H.
Supplies Hardware Co., Phila., Pa.
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- Skates, Roller.**
Henley, M. C., Richmond, Ind.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Smelting Works.**
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**
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- Speaking Tubes.**
Ostrander, W. R. & Co., 204 Fulton St., N. Y.
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- Spelter.**
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Tuck Mfg. Co., Brockton, Mass.
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- Steam Separators.**
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Lunkelmeier Co., Cincinnati, O.
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Superior Steel Co., Pittsburgh, Pa.
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Whitney, A. R. & Co., B'way, N. Y.
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- Steel (Mushet's Special).**
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Crescent Steel Co., Pittsburgh, Pa.
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Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
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Lukens Iron & Steel Co., Coatesville, Pa.
Morehead-McCleane Co., Pittsburgh, Pa.
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Singer, Nimick & Co., Pittsburgh, Pa.
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Lindsay, Jas. G. & Co., Phila., Pa.
Pierston & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**
Bethlehem Iron Co., S. Bethlehem, Pa.
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Montour Iron & Steel Co., Danville, Pa.
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Wiley & Russell Mfg. Co., Greenfield, Mass.
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Riehle Bros. Testing Mach. Co., Phila.
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Stanley Rule & Level Co., 29 Chambers, Starrett, L. S. Co., Athol, Mass.
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Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
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- Vise Jaws.**
Newark Mch. Tool Co., Newark, N. J.
- Vises.**
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Logan & Strobbridge Iron Co., New Brighton, Pa.
Millers Falls Co., 93 Reade St., N. Y.
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- Water Meters.**
Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Water Wheels.**
Poole, Robt. & Son Co., Baltimore, Md.
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- Window Cord, Makers of.**
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Baackes & Co., Pittsburgh, Pa.
Cincinnati Barb Wire Fence Co., Cincinnati, O.
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New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Prentiss, Geo. W. & Co., Holyoke, Mass.
Salem Wire Cloth Co., St. Louis, Mo.
Stewart Wire Co., Easton, Pa.
Trenton Iron Co., Trenton, N. J.
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Wetherell Bros., 93 Liberty St., N. Y.
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**
Barnum, E. T., Detroit, Mich.
California Wire Works, San Francisco, Cal.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. S., 65 Fulton, N. Y.
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New York Wire Cloth Co., 102 Chambers St., N. Y.
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Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleveland.
- Wire Cutters.**
King, J. M. & Co., Watertown, N. Y.
- Wire Dies.**
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- Wire Dowels.**
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Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
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New York Wire Cloth Co., 102 Chambers St., N. Y.
Scheeler & Sons, Buffalo, N. Y.
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- Wire Nails.**
Baackes & Co., Pittsburgh, Pa.
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- Wire Rods, Steel.**
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Broderick & Bascom Rope Co., St. Louis, Mo.
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Ekan Co., Cincinnati, Ohio.
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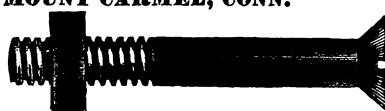
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Bigelow, C. R.....	51	Clauss Shear Co.....	71	Excelsior Needle Co.....	102	Ideal Machine Works.....	49
Signall & Keeler Mfg. Co.....	38	Clement & Dunbar.....	63	Eynon-Evans Mfg. Co.....	26	Ideal Mfg. Co.....	66
Billings & Spencer Co.....	88	Clendenin Bros.....	11	F. & N. Mfg. Co.....	92	Independent Electric Co.....	72
Bingham, W. Co.....	72	Cleveland Block Co.....	32	Fairmount Machine Co.....	45	Indiana Wire Fence Co.....	7
Birmingham Iron Foundry.....	21	Cleveland City Forge & Iron Co....	1	Fearing, Wm. S.....	2	Iowa Farming Tool Co.....	89
Bissell, E. Son & Co.....	54	Cleveland Stamping & Tool Co.....	78	Ferdinand L. W. & Co.....	72	Jacobus, W. H.....	94
Blair Mfg. Co.....	91	Cleveland Stone Co.....	46	Fitch, W. & E. T.....	101	Jarecki Mfg. Co.....	40
Blake & Johnson.....	10	Cleveland Twist Drill Co.....	43	Fitchburg Machine Works.....	33	Jeffrey Mfg. Co.....	33
Bliss Co., E. W.....	35	Cleveland Wood Turning Co.....	79	Flag, Stanley G. & Co.....	102	Jenkins Bros.....	1
Bloomsburg Mfg. Co.....	75	Clinton Wire Cloth Co.....	8	Folding Paper Box Co.....	68	Jenkins & Lingle.....	36
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Boston Casting Co.....	3	Columbus Sewer Pipe Co.....	59	Gaylord, F. L. Co.....	3	Keating Wheel Co.....	59
Boston Gear Works.....	27	Continental Iron Works.....	27	Geneva Cycle Co.....	72	Keeley, Jerome & Co.....	15
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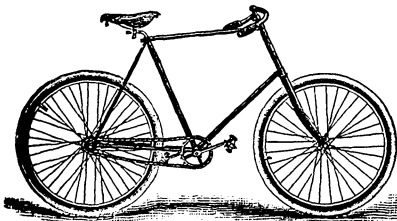
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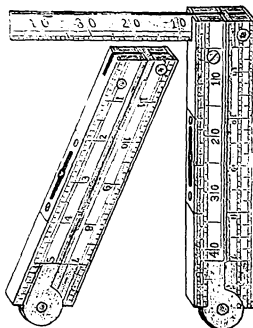
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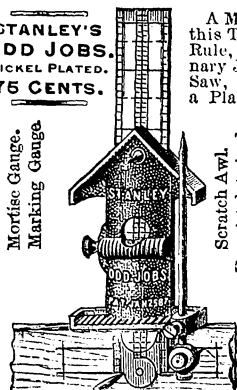
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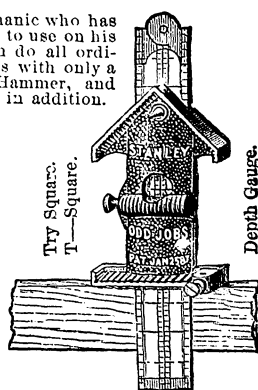
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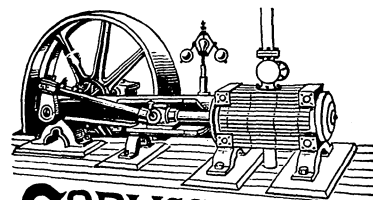
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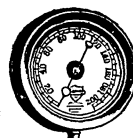
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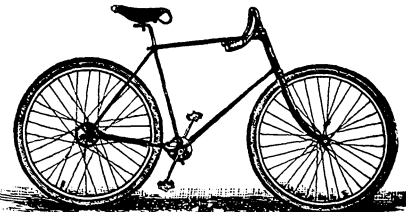
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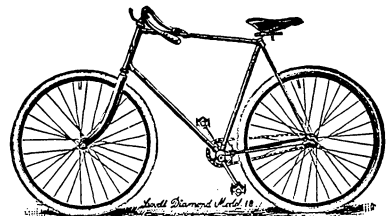
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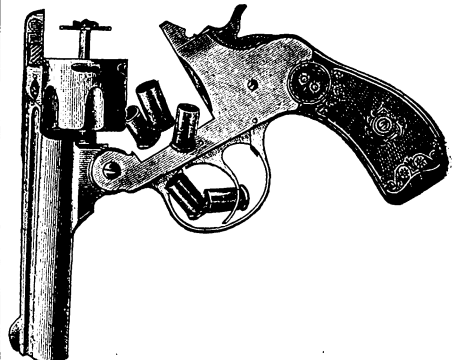
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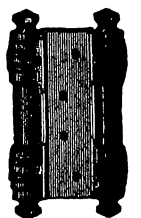
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6x2	$\frac{3}{4}$ to $1\frac{1}{2}$	3 $\frac{1}{2}$ in	63
7x2	$\frac{1}{2}$ to $1\frac{3}{4}$	4 in	64
7x2 $\frac{1}{2}$	$\frac{1}{2}$ to $1\frac{1}{2}$	5 in	65
7x2 $\frac{1}{2}$	$\frac{1}{2}$ to $1\frac{3}{4}$	6 in	66
8x2 $\frac{1}{2}$	$\frac{1}{4}$ to $1\frac{1}{2}$	7 in	67
8x3	$\frac{1}{2}$ to $2\frac{1}{4}$	8 in	68
9x3	$\frac{1}{4}$ to $2\frac{1}{2}$	10 in	69

FOR SCREEN, MEDIUM AND HEAVY DOORS.
Single and Double Acting.

THE $\frac{3}{4}$ AND 4 INCH
ARE THE BEST IN
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SCREEN DOORS.



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MANUFACTURED BY

Van Wagoner & Williams Hardware Co.,
CLEVELAND, O., and 14 WARRIN ST., N. Y.

THE IRON AGE

THURSDAY, DECEMBER 13, 1894.

Bimetallic Telephone Lines.

It has long been known that a wire composed of a steel core and a thick copper coating has greater electric conductivity than copper alone, besides possessing greater strength. The first use made of the bimetallic wire was in telegraphy, and afterward it was tried for telephone service with equally good results. The general fact was brought out a year or two ago by General Eckert, now president of the Western Union Telegraph Company, that if a single wire of this sort were employed in telephoning, with the earth for a means of returning

when the bare wire was immersed in a lake that communication was stopped. Experiments were also made with a silicon bronze wire, which withstood still more severe tests. The line could be cut and the ends inserted into the ground, not merely a few inches, but several feet apart, without effect. Six such breaks, short ones, were made in a line 150 yards long, and one break nearly or quite 45 feet long in another line, and in both instances signals were audible, though faint.

What looks like a possibly important new outlet for wrought iron pipe is a

The Will Foundry Sifting-Machine.

A sand sifting machine has been designed by Edwin C. Will, foreman of the foundry of Russell & Co. of Massillon, Ohio, where it has been in continuous operation for the last 12 months. It is used to sift sand, mix and sift facings. To operate the machine, the handle on the cylinder shaft, shown in Fig. 1, is turned, when the elevators take the sand from the floor or heap and dump it on top of the sieve, which is a cylinder made of any desired mesh of wire. The method of operat-

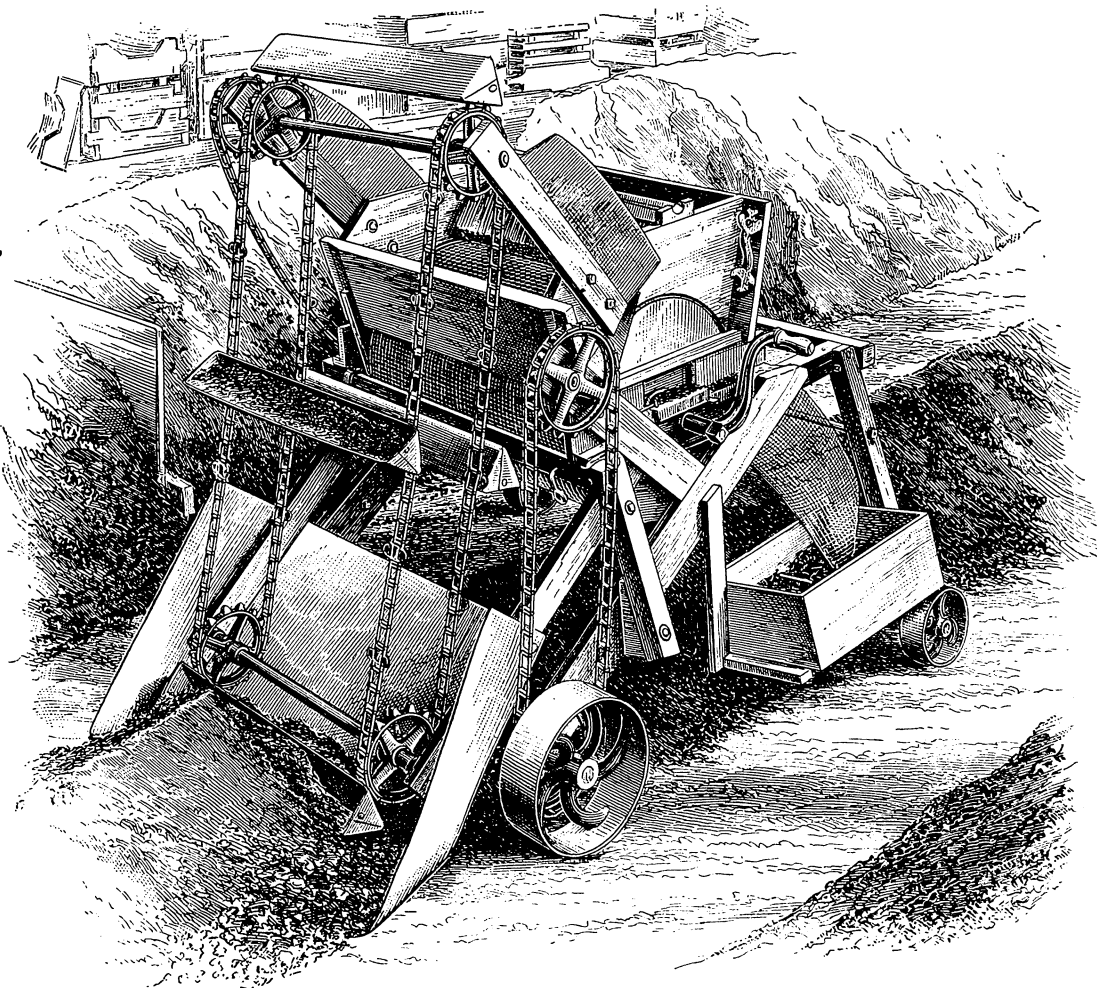


Fig. 1—Front View.

THE WILL FOUNDRY SIFTING-MACHINE.

the current, conversation would be more distinct than if copper alone was resorted to, and there were two wires, forming a complete metallic circuit. Some interesting details corroborative of that statement are afforded in the recently issued report of the Chief Signal Officer of the United States Army. General Greely tried bimetallic wire laying on wet grass and in a half mile of mud, had a few turns of it made about an iron bar driven into the ground at a point on the route, made a connection with a buried water pipe, and otherwise gave the electric current a good chance to escape, and yet without materially affecting conversation over the line. It was only

new method for baling cotton which is being developed by the Bessonette Cotton Compress & Mfg. Company of Waco, Texas. The bale is taken directly from the gin and rolled in the lap around an iron pipe. Tests made with the new bale have shown that the cotton thus baled does not burn.

A Worthington pumping engine, built by James Simpson & Co. of London for the New River Company, showed by the tests of Prof. Alex. B. W. Kennedy a duty of 139,500,000 foot pounds per 112 pounds of coal, or 14.2 pounds of steam per indicated horsepower per hour.

ing the elevator shaft by a chain from a sprocket wheel on the cylinder shaft is shown in Fig. 2. As the cylinder is revolved the sand is sifted twice by going through first the top and then the bottom of the cylinder. A brush extends the full length of the sieve and serves the double purpose of crushing all lumps and cleaning the sieve every time the cylinder moves. Nails, scrap, &c., pass under the brush and are caught by a second sieve, Fig. 2, which stands at an angle, and has a motion imparted to it by an eccentric and spring. All refuse thus caught travels down into the box shown.

The forward and backward motions of

the machine is controlled by the chain gear shown in Fig. 1. The operator turns the sieve with his right hand and moves the machine with his left hand by means of the chain connecting with the forward axle. The fender in front sweeps the floor clean and is hung at such an angle that when the sand has been sifted the machine can be run backward over the heap to an out-of-the-way place. One man can mix and sift an average of 25 shovelfuls per minute. It is stated that before the introduction of this machine it required the services of two men and cost \$30

Meeting of Western Stove Makers.

On Tuesday, December 4, most of the large and prominent stove manufacturers, members of the Northwestern and Southwestern branches of the National Association, gathered at the Grand Hotel in Cincinnati. The subject of prices and other important matters were discussed at the preliminary meeting, Tuesday morning, preparatory to bringing certain affairs before the subsequent meeting in the evening, as well as before the annual meeting of the

trouble arising from this fact by mutual concessions and modifications of rules and by-laws.

The subject of prices, however, proved to be the most fertile of any considered, and was the occasion for some hot words among the disputants. The fact that the trust or anti trust laws were run counter to in the attempt to arrange prices would indicate that such a combination was under consideration, or rather that the establishment of uniform prices upon certain classes or grades of castings might be construed by legal ability as in violation of the

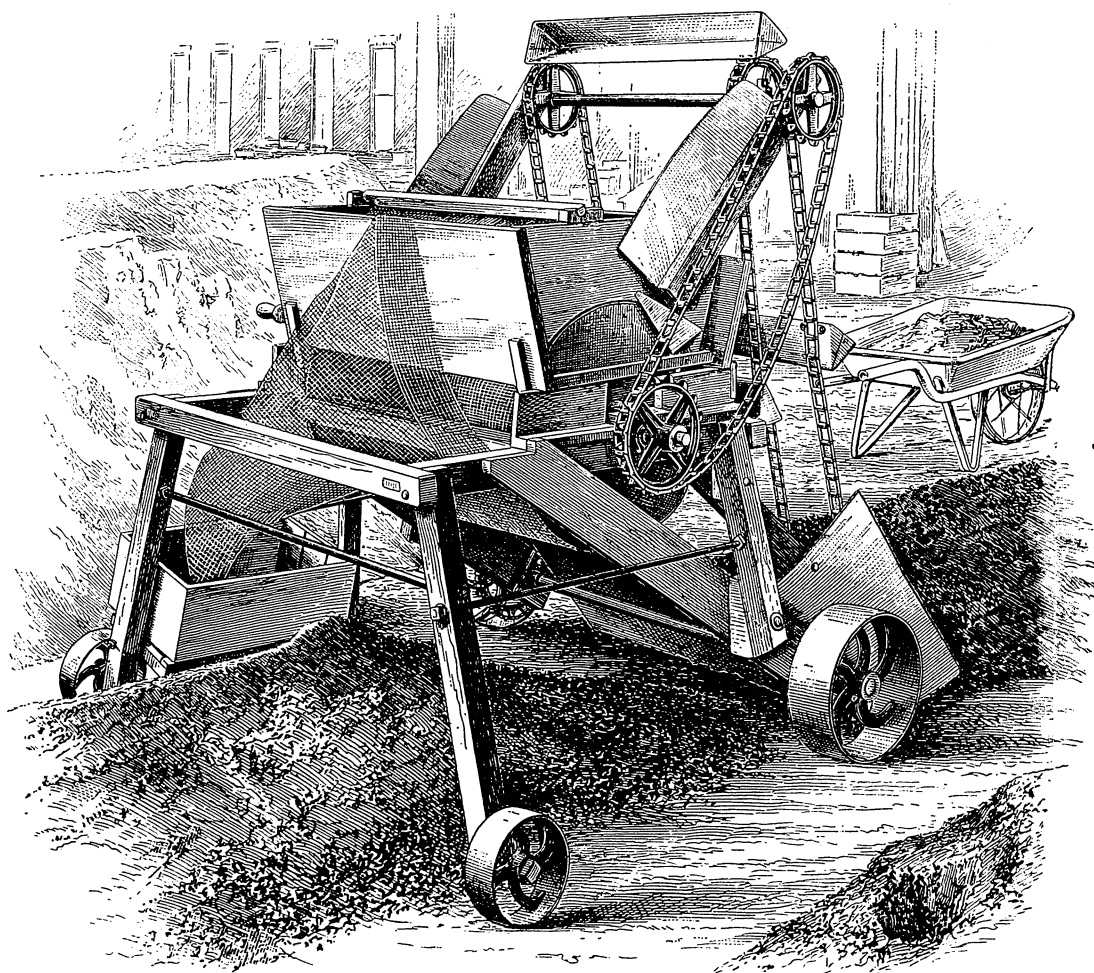


Fig. 2.—Rear View.

THE WILL FOUNDRY SIFTING-MACHINE.

for the old style sieves per year, in order to sift the same quantity.

The November fire loss of the United States and Canada, as estimated by the *Journal of Commerce*, was \$12,135,800, an increase of nearly \$650,000 over the figures for November, 1893. This loss is the largest of any month in this year except July, and exceeds the October figures by \$4,000,000. During November the fires of a greater destructiveness than \$10,000 each reached the large total of 187. So far, the losses for 1894 are, however, over \$26,000,000 less than for the same period of 1893. The current year appears to be the best the fire companies have experienced for a very long period, and the opinion in insurance circles is that the better class of companies will secure a considerable profit in the year 1894.

The city of San Antonio, Texas, will expend \$500,000 on a new sewerage system.

National Association to be held at Chicago.

At the meeting on Tuesday night the matter of freight rates was discussed and fully considered. As is generally known in the trade, stoves in less than carloads have been until recently classified by the transportation companies as third, and in full car lots as fifth class freight, and subject to tariff accordingly. Two weeks ago, however, stoves were transposed into second class, with, of course, a corresponding advance in rates of freight. This change has been regarded, naturally, with disfavor by the manufacturers.

One of the prime objects of the meeting was the sincere desire to harmonize the differences which have heretofore existed between the Southwestern and Northwestern branches of the parent organization. One of the branches, it is stated, has heretofore enjoyed priority because of having first entered the general society, and it has been regarded as desirable to eliminate any source of

trust laws which have been enacted recently.

The most important meeting of the series was held on Wednesday afternoon, following a complimentary lunch, tendered the members present by Matthew Addy & Co. The lunch, or rather banquet, was a handsome affair, with flowers and all the other accessories to make the feast enjoyable and pleasant. The toasts were grave and witty and brilliant. James A. Greene of Matthew Addy & Co. occupied the head of the table as host, while Geo. H. Barbour of Detroit was toastmaster. Mr. Addy was presented by the toastmaster in a few fitting remarks and gracefully responded to the acclamations which greeted his introduction. Lizard Kahn of Hamilton, D. M. Thomas, secretary of the National Association; Grange Sard of Albany, N. Y.; J. W. Van Cleave of St. Louis, J. A. Greene of Cincinnati, Frederic Gardner of Chicago and W. W. Baldwin of Cleveland responded in turn to the

call of the toastmaster, with good words for Mr. Addy, the Queen City and the trade.

After cigars, the entire company joined in singing "Auld Lang Syne."

On Tuesday evening the members were entertained by F. & L. Kahn & Bros. and the S. Obermayer Company jointly, and on Wednesday evening the assembly were the guests of the S. Obermayer Company.

About 50 members arrived on Tuesday, and this number was about doubled before the assembly finally adjourned. The various cities represented were Detroit, Albany, Chicago, St. Louis, Piqua, Vincennes, Zanesville, Quincy, Aurora, Ill.; Cleveland, Muncie, Marietta, Columbus, Hamilton and others.

Geo. D. Dana of St. Louis presided and D. M. Thomas of New York was secretary.

Among the founders were noticed G. H. Barbour and John M. Dwyer of the Michigan Stove Company of Detroit, Lazard Kahn of Hamilton, W. W. Baldwin of Cleveland, Fred. Gardner of Chicago, Grange Sard of Albany, W. H. Cribben of Chicago, A. T. Nye of Marietta, Ollo Kirschner and H. L. Wilton of Detroit, C. L. Collins of Bay City.

Drawback Rates.—II.

The Treasury Department has issued a synopsis of all the decisions rendered during the past few years in regard to drawback rates. We print below those likely to be of interest to the readers of *The Iron Age*:

Petroleum Barrels: manufactured by the Tide Water Oil Company, New York City; bound with hoops from imported hoop steel, same as duty paid on steel. Allow 11½ pounds for each barrel bound with hoops of dimensions and gauge as follows: Two head hoops, 1½ inches wide, 69¼ inches long, No. 16 wire gauge; two quarter hoops, 1½ inches wide, 73¼ inches long, No. 17 wire gauge; two bilge hoops, 1½ inches wide, 80¼ inches long, No. 16 wire gauge.

Plates: manufactured by Naylor & Co. of Boston, Mass., from bar iron, same as duty paid. Add 5 per cent. to net weight.

Plates, tack, same as duty paid. Add 2 per cent. to exported weight to cover wastage in manufacture.

Plows, manufactured by A. B. Farquhar & Co., New York, same as duty paid on steel. No. 75 plow, steel coulters, 8½ pounds each; No. 3 plow, steel coulters, 12 pounds each; No. 3 plow, steel molds, 23 pounds each; No. 3 plow, steel shares, 8 pounds each.

Rifles: manufactured by E. Remington & Sons, same as duty paid on the imported steel used. Allow 11 pounds of steel for each rifle, subject to provision of section 3020, Revised Statutes, as to relative value of the imported and domestic materials.

Rivets of barrels: manufactured by Atlantic Refining Company of Philadelphia, Pa., same as duty paid on imported steel rods. Allow 11 pounds for each 100 barrels.

Rivets: manufactured by the Brooklyn Wire Nail Company, wholly of imported iron rods, same as duty paid. Add to net weight exported rivets 3 per cent. of such weight.

Rivets: manufactured by Cobb & Drew, Plymouth, Mass., wholly from imported iron, same as duty paid. Add 5 per cent. to net weight.

Rods: manufactured by Naylor & Co. of Boston, Mass., from bar iron, same as duty paid. Add 9 per cent. to net weight.

Roofing, galvanized corrugated sheet iron, from sheet iron and spelter, same as duty paid. Proportion of spelter and iron to be stated in manufacturer's affidavit in each entry.

Sad Iron: manufactured by Bliss & Drake of Newark, N. J., at following rates per dozen:

For No. 1, weighing not less than 39 pounds to the dozen, 16 6 per cent.

For No. 2, weighing not less than 48 pounds to the dozen, 19.6 per cent.

For No. 3, weighing not less than 58 pounds to the dozen, 23.6 per cent.

For No. 4, weighing not less than 47 pounds to the dozen, 19.6 per cent.

For No. 5, weighing not less than 55 pounds to the dozen, 23.6 per cent.

For No. 6, weighing not less than 67 pounds to the dozen, 26.6 per cent.

For No. 7, weighing not less than 77 pounds to the dozen, 29.6 per cent.

For No. 8, weighing not less than 89 pounds to the dozen, 33.6 per cent.

For No. 9, weighing not less than 97 pounds to the dozen, 36.6 per cent.

For No. 10, weighing not less than 113 pounds to the dozen, 42.6 per cent.

For No. 3½, weighing not less than 63 pounds to the dozen, 25 per cent.

Saws, band and band saw blanks: Manufactured by Joshua Oldham of New York City, from imported steel plates, same as duty paid. Add to the net weight of each size and variety of saw or blank exported the following percentages:

Width.	Length.	Gauge.	Percentages.	
			Band saws.	Band saw blanks.
Inches.	Feet.	No.		
6	31	17	24.79	12.10
7	45	16	23.55	12.32
8	48	15	19.57	11.08
9	48	15	18.58	11.11
10	48	15	18.49	11.10
11	48	14	15.42	9.65
12	48	14	14.81	9.64

Screw Rings: manufactured by the Atlantic Refining Company of Philadelphia, Pa., from imported IC tin plate, and attached to exported 5-gallon petroleum cans, same as duty paid. Allow for each 1000 screw rings made from 14 x 19¼ inch plates 7.066 pounds, and for each 1000 screw rings made from 10 x 20 plates 6.292 pounds.

Scythes, scoops, shovels and spades, same as duty paid on quantity of materials used, as stated in manufacturer's affidavit on each entry, such quantity not to exceed the exported net weight by more than 25 per cent. of such weight.

Seamless Brass Boiler Tubes of locomotives, built by Burnham, Williams & Co. of Philadelphia, Pa., same as duty paid. Deduct 1½ per cent. from total amount paid on said importations.

Seamless Copper Boiler Tubes, used by the Baldwin Locomotive Works of Philadelphia, Pa., 99.3 per cent. duty paid.

Shapes: manufactured by Naylor & Co. of Boston, Mass., from bar iron, same as duty paid. Add 9 per cent. to net weight.

Smoothing Irons, self heating or charcoal: manufactured by Bliss & Drake of Newark, N. J., at the following rates per dozen:

For No. 1, weighing not less than 59 pounds to the dozen, 20 cents.

For No. 2, weighing not less than 77 pounds to the dozen, 26 cents.

For No. 3, weighing not less than 78 pounds to the dozen, 26.4 cents.

For No. 4, weighing not less than 87 pounds to the dozen, 29.6 cents.

Solder used in cans on imported lead used, 2.465 pounds per 100 cans.

Solder used in 5-gallon oil cans, composed of lead and imported pig tin, same as duty paid. Limited 1.449 pounds pig tin per 100 cans.

Solder used in soldering tin cans, other than 5-gallon square cans, 1 cent for each 1000 running inches of the soldered seams.

Spikes from scrap iron or steel, same as duty paid. Add 20 per cent. to exported weight.

Splice Bars, bolts, rivets, hinges, pins and miscellaneous forgings: manufactured by W. Ames & Co. of Jersey City, N. J., wholly from imported old rails and old scrap iron, same as duty paid. Add to net weight of all the exported articles, except bolts with nuts fitted, 20 per cent. to net weight; bolts with nuts fitted, 25 per cent. Quantity of material to be identified ascertained by adding to total net weight of all exported articles 38 per cent.

Staples, galvanized wire, manufactured by the Iowa Barbed Wire Company of Easton, Pa., from Bessemer steel rods and spelter, same as duty paid. Allow 94 pounds of steel rods and 8 pounds of spelter for every 100 pounds of the exported staples.

Steam Motors: manufactured by the Baldwin Locomotive Works of Philadelphia, Pa., from imported seamless brass tubes, same as duty paid. Deduct 2 per cent. to cover value remaining scrap.

Steam Motors with boilers: manufactured by Burnham, Parry, Williams & Co. of Philadelphia, Pa., from steel plates, same as duty paid. Deduct from original weight of plates 4 per cent.

Steel Butts: manufactured by the Stanley Works of New Britain, Conn., from steel billets. Add to net weight exported article 28 per cent. of such weight.

Steel, cast, tool, from iron, same as duty paid. Add 5 per cent. to exported weight.

Steel Cam Shafts for mining stamp mills: manufactured by the Golden State and Miners' Iron Works of San Francisco, Cal., from imported round steel bars, same as duty paid. Add to net weight 10 per cent.

Steel Clock Spring Material, rolled, tempered, polished and prepared for cutting into lengths suitable for clock springs: manufactured by R. H. Wolff & Co., Limited, of New York City, from imported steel wire rods, same as duty paid. Add 16 per cent. to net weight of exported article.

Steel Dies: manufactured by the Pratt & Whitney Company, Hartford, Conn., from imported steel, same as duty paid on net weight exported article.

Steel Drills: manufactured by the Standard Tool Company of Cleveland, Ohio, wholly from round bar tool steel, by cutting the drill from cold bar, same as duty paid. Add 96 per cent. to net weight.

Steel Eye Bars: manufactured by the Union Bridge Company of Buffalo, N. Y., wholly from imported steel bars, same as duty paid. Add to net weight 2 per cent. of such weight.

Steel Nails: manufactured by the Danville Nail & Mfg. Company of Danville, Pa., and Fall River Iron Works Company of Fall River, Mass., also Harrisburgh Nail Works, wholly from imported steel slabs, same as duty paid. Add to net weight of the exported nails 7½ per cent.

Steel Nails: manufactured by the Danville Nail Mfg. Company of Danville, Pa., wholly from imported steel shearings or cuttings, same as duty paid. Add to net weight exported nails 7½ per cent. of such weight.

Steel Nails in wooden cases of exported petroleum: manufactured by the Brooklyn Wire Nail Company of Brooklyn, N. Y., from steel rods, same as duty paid. Add to the allowance of 11.45 pounds per hundred cases 7 per cent. of such allowance.

Steel Pipes, galvanized or asphaltum, and tar-coated steel pipes: manufactured by Francis Smith & Co., San Francisco, Cal., from steel sheets, same as duty paid. Deduct from net weight of galvanized pipes 9 per cent.; asphaltum and tar-coated pipes, 6¼ per cent.

Steel Shanks: manufactured wholly from imported steel, same as duty paid; quantity of material so used will be ascertained for all "shanks with parallel edges" by adding to the net weight of the exported article 5 per cent. of such net weight, and for "custom steel shanks," manufactured by Dunbar, Hobart & Whidden of South Abington, Mass., by adding to the exported net weight 35 per cent. thereof.

Steel Wire Nails: manufactured by the Brooklyn Wire Nail Company wholly from imported steel rods, same as duty paid. Add to net weight of such nails 7 per cent.

Tacks and Shoe Nails: manufactured wholly from imported bar steel, same as duty paid. For tacks add to net weight of the exported articles 14 per cent.; shoe nails, add to exported net weight 9 per cent.

Tacks and Shoe Nails: wholly manufactured from imported steel blooms, same as duty paid. Add to net weight of exported articles for tacks 15 per cent. and for shoe nails 13 per cent. of such weight.

Tacks from bar iron, same as duty paid. Add 14 per cent. to exported quantity to cover wastage in manufacture.

Tacks or Nails, trunk: manufactured by E. Phillips & Sons from iron, same as duty paid. Add 6 per cent. to net weight.

Tin Cans, 1-pound salmon; samples of blanks and scrap to be weighed and allowance made for wastage equal to weight of scrap, not to exceed 25 per cent. of weight of blanks.

Tin Cans filled with domestic tobacco, 90 per cent. of duty paid on tin plates.

Tin Cans, 5-gallon rectangular, made from a combination of two plates 14 x 18½ inches, with one plate 10 x 20 inches. Allow for each 100 cans 52,460 square inches of 14 x 18½ plates, or 1,6117 boxes of 124 sheets each, and 19,944 square inches of 10 x 20 plates, or 0.4432 of a box of 225 sheets each.

Tin Caps, plain: manufactured by the Devos Mfg. Company of New York City from imported taggers tin plates, same as duty paid. Allow 7 pounds plates for each 1000 plain tin caps.

Tin Caps, plain: made by the Standard Oil Company of New York, Devos Works, New York City, from imported 14 x 18½ coke tin plates, each box averaging 110 pounds and containing 124 sheets, and attached to 5-gallon tin cans, same as duty paid on 13.7 pounds of tin plates for each 1000 plain tin caps.

Tin Caps, made by Standard Oil Company of New York at their works at Constable Hook, N. J., from imported 14 x 18½ IC coke tin plate (each box weighing from 109 to 110 pounds and containing 124 sheets), and attached to 5-gallon cans exported, same as duty paid on 15.6 pounds of tin plate for each 1000 tin caps.

Tin Caps, plain: made by the Standard Oil Company of New York, Sone & Fleming Works of New York, from imported 14 x 18½ tin plates, each box weighing not less than 109 pounds and containing 124 sheets, and attached to 5-gallon tin cans, same as duty paid on 12.7 pounds of tin plate for each 1000 plain tin caps.

Tin Handle Blanks made from imported IC tin plate, attached to 5 gallon tin petroleum cans: manufactured and exported by the Atlantic Refining Company of Philadelphia, Pa., same as duty paid. Allow 8 pounds of 14 x 19½ IC tin plate or 8.3 pounds of 10 x 20 IC tin plate for each 1000 Atlantic handle blanks, and 6.71 pounds of 14 x 19½ IC tin plate for each 1000 standard handle blanks.

Tin Handles for petroleum cans: manufactured by Lombard, Ayers & Co of New York, wholly from imported plate, attached to tin cans exported with petroleum, same as duty paid. Allow 2.3 pounds of plate for every 100 handles.

Tin Handles, nozzle bodies and caps, attached to tin cans. On high tin handles made from imported IC tin plate, and on low screw tin nozzle bodies and flat tin caps made from imported taggers tin attached to 5-gallon tin cans, manufactured and exported by the Standard Oil Company of New York, Sone & Fleming Works, same as duty paid. Allow 40 pounds of IC tin plate for each 1000 high tin handles, 10 pounds of taggers tin plate for each 1000 low screw tin nozzles, and 7 pounds of taggers tin plate for each 1000 flat tin caps.

Tin Shingles: manufactured by the Cortright Metal Roofing Company, Philadelphia, Pa., from imported tin plate and domestic paint, same as duty paid on tin. Allow 96½ pounds tin to each 100 pounds shingles.

Tin Tags, stamped, plain and decorated: manufactured by Somers Bros. of Brooklyn, N. Y., from imported tin plates, same as duty paid. Plain tags, add to net weight of tags 15 per cent. of such weight, decorated tags allow only for such net weight, provided that no scrap tin was used in the manufacture of such tags.

Tinned Wire: manufactured by Horace Lamb & Co. of Northampton, Mass., and Washburn & Moen Mfg. Company of Worcester, Mass., from imported steel. Deduct from net weight the following percentage of such weight according to the gauge number of the wire and the process of tinning used, viz:

For Wire Tinned and Wiped.

G. No.	Deduction. Per cent.	G. No.	Deduction. Per cent.
2.....	0.28	17.....	0.37
3.....	0.28	18.....	0.38
4.....	0.28	19.....	0.38
5.....	0.28	20.....	0.40
6.....	0.30	21.....	0.40
7.....	0.30	22.....	0.40
8.....	0.30	23.....	0.50
9.....	0.30	24.....	0.50
10.....	0.33	25.....	0.50
11.....	0.33	26.....	0.60
12.....	0.33	27.....	0.60
13.....	0.34	28.....	0.60
14.....	0.37	29.....	0.72
15.....	0.37	30.....	0.72
16.....	0.37		

For Wire Dipped and Tinned.

8-0.....	2.0	6.....	3.0
4-0.....	2.2	7.....	3.0
2-0.....	2.4	8.....	3.3
2-0½.....	2.4	9.....	3.3
0½.....	2.4	10.....	3.6
2.....	2.7	11.....	3.6
3.....	2.7	12.....	3.9
4.....	2.9	13.....	3.9
5.....	2.9		

Trucks built by the Baldwin Locomotive Works, Philadelphia, Pa., in part from imported steel tires, axles and springs, same as duty paid on imported articles. Deduct 58 cents per 100 pounds to cover value of waste.

Victor Graters: manufactured by David Block of New York City from imported tin plates, same as duty paid. Add to net weight 15 per cent.

Wire and Hemp Cable or rope: manufactured by J. A. Roebling's Sons Company, Boston, Mass., same as duty paid.

Wire, galvanized barb: manufactured by the Washburn & Moen Mfg. Company of Worcester, Mass., same as duty paid. Allow 80 pounds of wire and 17 pounds of rods for each 100 pounds of the exported article.

Wire, galvanized or ungalvanized, made wholly from imported iron or steel, and if galvanized, coated with imported spelter or zinc, and on articles made wholly from such wire allow duty paid on quantity of materials used, to be determined by adding to the net weight of the exported article (less the weight allowed for spelter when the wire is galvanized) an allowance for wastage, as follows:

Size of the wire by the wire gauge.	Add to weight of wire made from—	
	Imported rods.	Imported bars.
	Per cent.	Per cent.
1 and coarser.....	2.7	10.7
2 and coarser.....	2.9	10.9
3 and coarser.....	3.1	11.1
4 and coarser.....	3.3	11.3
5 and coarser.....	3.5	11.5
6 and coarser.....	3.7	11.8
7 and coarser.....	4.0	12.1
8 and coarser.....	4.3	12.4
9 and coarser.....	4.6	12.7
10 and coarser.....	4.9	13.0
11 and coarser.....	5.2	13.4
12 and coarser.....	5.5	13.8
13 and coarser.....	5.9	14.2
14 and coarser.....	6.3	14.6
15 and coarser.....	6.7	15.0
16 and coarser.....	7.1	15.4
17 and coarser.....	7.4	15.7
18 and coarser.....	7.7	16.0
19 and coarser.....	8.0	16.3
20 and coarser.....	8.3	16.7
21 and coarser.....	8.6	17.0
22 and coarser.....	8.9	17.8
23 and coarser.....	9.2	17.6
24 and coarser.....	10.4	19.3
25 and coarser.....	10.8	19.6
26 and coarser.....	11.2	19.9
27 and coarser.....	11.6	20.2
28 and coarser.....	11.9	20.6
29 and coarser.....	12.2	20.9
30 and coarser.....	12.5	21.2
31 and coarser.....	12.8	21.5
32 and coarser.....	13.2	21.8
33 and coarser.....	13.5	22.2
34 and coarser.....	13.8	22.6
35 and coarser.....	14.1	23.0
36 and coarser.....	14.0	25.2
37 and coarser.....	16.8	26.0
38 and coarser.....	17.6	26.8
39 and coarser.....	18.4	27.6
40 and coarser.....	19.2	28.4

Sizes designated by fractional numbers to be treated as those designated by the next smaller integral number. If the wire is galvanized, allow of quantities exported the following percentages for the spelter or zinc used, viz: For wire Nos. 0 to 4, 2 per cent.; 5 to 7, 3½ per cent.; 8 to 10, 5 per cent.; 11 to 13, 6½ per cent.; 14 to 16, 7½ per cent., and 17 to 20, 10 per cent.

Wire, barbed: manufactured by the Washburn & Moen Mfg. Company, from steel rods and spelter, same as duty paid. Allow 94 pounds of steel rods and 6 pounds of spelter for every 100 pounds of the exported article.

Wire, barbed fence: manufactured by the Pittsburgh Hinge Company from galvanized steel wire, same as duty paid. Add 2 per cent. to net weight.

Wire, barbed fence, galvanized, and staples: manufactured by Oliver Wire Company (Limited) of Pittsburgh, Pa.,

from steel wire rods and spelter, same as duty paid. Allow for each 100 pounds of fence wire No. 9, 101 pounds wire rods and 5½ pounds spelter; for No. 12½, 104 pounds rods and 4 pounds spelter, and for staples, 100 pounds rods and 6 pounds spelter.

Wire, barbed fence and staples: manufactured by H. W. Oliver, Jr., same as duty paid. Add for wire No. 9, 2.15 per cent.; for No. 10, 1.93 per cent.; for No. 12½, 3.3 per cent., and for staples, 1.78 per cent. to exported net weight.

Wire, binder, from steel, same as duty paid. Add 9 per cent. to net weight.

Wire Rope, from iron or steel and jute, same as the duty paid on the metals. Add for wastage the same percentages as prescribed for wire.

Wood Screws, from iron, same as duty paid. Add 50 per cent. to exported weight to cover wastage in manufacture.

The Foundrymen's Association.

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club in Philadelphia on Wednesday, December 6, the president, Francis Schumann, occupying the chair.

Among those present were the following: Walter Wood, R. D. Wood & Co.; W. H. Pfahler, Abram Cox Stove Company, Philadelphia, Pa. Fred. Baldt and W. H. Bickley, Penn Steel Casting & Machine Company, Chester, Pa. T. B. Harkins, T. B. Harkins Foundry Company, Bristol, Pa. Thos. Hobson, *The Iron Age*; Wm. Fox, J. Fox & Sons, Philadelphia, Pa. C. R. Schmidt, Hy. McShane Mfg. Company, Baltimore, Md. J. S. Hibbs, J. W. Paxson & Co., Philadelphia, Pa. J. S. Stirling, Harlan & Hollingsworth Company; Geo. A. Messick, Pusey & Jones Company, Wilmington, Del. W. H. Derbyshire and J. R. Hanthorn, Bement, Miles & Co.; Dr. Kirk; Thos. J. Rankin, Abram Cox Stove Company; Fred. Stahl, Girard Iron Foundry; Jno. Hoskins and Colonel Hufty, Hunter Steel Company; S. G. Flagg, Jr., S. G. Flagg & Co., Philadelphia. R. A. Regester, J. Regester & Sons, Baltimore, Md. Geo. Rominger, Hy. Ruhland & Co., Philadelphia. Geo. Trickett; E. F. Lewis and T. S. Lewis, Farrell Foundry & Machine Company, Waterbury, Conn. F. A. Riehle, Riehle Testing Machine Company, Philadelphia. W. H. Green, Jr., Vulcan Works, Chester, Pa. Wm. Wark, Dienelt & Eisenhardt; V. Angerer and I. R. Newkirk, Wm. Wharton, Jr., & Co.; Dr. Jno. A. Hunter, Hunter Steel Company, Philadelphia, Pa. P. Kennedy, Baltimore Malleable Iron Company, Baltimore, Md. Robert McHatton, McHatton & Wright; J. S. Bancroft, Jr., and A. Outerbridge, Wm. Sellers & Co.; E. E. Brown, E. E. Brown & Co.; W. C. Henderson, Thomas Devlin & Co., Philadelphia. W. J. Keep, Michigan Stove Company, Detroit, Mich. Jno. Birkinbine, Weimer Machine Company, Lebanon, Pa. Daniel Egan and Fred. Frazar, American Steel Casting Company, Thurlow, Pa. Francis Schumann, Tacony Iron & Metal Company, Tacony, Pa. J. Hy. Pepper, *The Iron Age*; J. Morris Perot, Hunter Steel Company, Philadelphia. Edw. L. Phillips, Hewes & Phillips, Newark, N. J. Geo. W. French, J. J. Mohr, Philadelphia. W. E. Sessions, Sessions Foundry Company, Bristol, Conn. F. A. Lott, Davis Coal & Coke Company, Baltimore, Md. W.

J. Warner, Rogers, Brown & Warner, Philadelphia. Leslie Griscom, Diamond Drill & Mfg. Company, Birdsboro, Pa. R. E. Carey, Monitor Iron Works, Elizabethport, N. J. Josiah Thompson, J. Thompson & Co., Philadelphia. Rev. Isaac Naylor, Hornsey, England. Wm. Davis, Wm. Davis Tool & Hardware Company; Thos. Dalby, Dalby & Fulmer, Philadelphia.

The reading of the minutes of the last meeting was dispensed with, the same having appeared in *The Iron Age* of November 15.

The Executive Committee in making their report stated that during the past several months they had not seen any general improvement in the foundry trade and they could not do otherwise than make the same report to this meeting. In regard to prices they reported that there was little change, the same being, if anything, lower. The question would seem to be whether they had reached bottom, or had there been any tendency toward an improvement both in price and quantity. Possibly in some shops there had been a decided improvement, but the committee were of opinion that the average was rather worse than better. The recent election would, all through the country, seem to imply that a change was wanted and that the passage of the new tariff bill did not accord with the feelings of the general public. There was no alternative now but to submit to it, and no change could be made in that direction for nearly two years. How soon are foundrymen going to conform themselves to it, and when were they to have more trade and at better prices? These were questions they were thinking about, and which had no answer. All had expected a good fall trade, but the season had passed and not even a small boom had struck them. The only thing now to be said was that they expected a boom in the spring, but it would be necessary to wait until spring to see what would happen. The present was the time above all others that the committee believed foundrymen's associations as well as all other organizations should come together for mutual benefit, and should have frequent meetings and talk over the possibilities and probabilities, that they might be better prepared to adjust themselves to the times.

The end of the year was near at hand. The committee ventured to say that there was a greater percentage of business houses in the different branches of trade that had lost money during the past year than those who had made a profit. It was the hope of the committee that the coming year would be accompanied by better and more prosperous times.

The Price Committee was then called on by sections.

Cast Iron Soil Pipe Section.—R. A. Register, for this section, stated he had no report to make.

Sash Weights.—E. E. Brown reported that there was little or no change, business being in bad condition.

Malleable and Gray Iron Castings.—Stanley G. Flagg, Jr., in reporting for this section, said it was a question whether it was advisable for him to report too much about the malleable iron business. He had heard of a case where \$2.85 had been quoted for delivery of castings in Cleveland, and at this price the job was lost. The price for the castings in gray iron should have been 3 cents per pound.

Cast Iron Water and Gas Pipe.—P. D. Wanner, for this section, reported

that the end of the season was approaching, and at this time there were no fixed prices, nor had there been during the whole year. If pipe founders were of his mind they would feel like closing up until February or March of next year.

Election of new members being next in order, the Fuel Economizer Company, Matteawan, N. Y., were elected to membership in the association.

Dr. Hunter of the Hunter Steel Company, Philadelphia, then addressed the meeting in explanation of his process for converting white iron castings from the cupola into steel castings. He exhibited several samples of hatchets made from white iron castings which attracted much attention. In the discussion which followed, John Birkinbine, Philadelphia, referring to a broken sample on the table before him said that he recognized it as a piece shown him some time ago. He had faith in the person whom he knew had broken this sample, and who had shown him the original iron with the sample. The formula, when he heard it, appeared to him antagonistic to what he believed to be the actual result; on the other hand, he saw no reason to doubt that results could be obtained. He had seen nothing more than had been seen there that evening, and had never seen the process tried, been present when pieces were heated, nor seen an analysis of the iron before treatment, or of the result of the treatment. There had been a furnace erected in Philadelphia and it appeared to him as though the process was worth being pushed to see what results could be obtained. There was just as much doubt a few years ago as to the possibility of making steel out of high phosphorus iron and all present knew what had been done in that direction. It was owing to metallurgical interest to sift this matter to the bottom. It offered surprises, but so did other things. They were probably just as much surprised to hear of the case hardening of armor plate as to hear of the process before them. If the process would produce uniform results, and it was under control, it offered to the metal trade a very wide field. He instanced other wonderful processes in manufactures and said that because these things were surprises it should not be thought they were impossibilities. If what Dr. Hunter had done in an experimental way could be done in a commercial way he thought it would result to the advantage of those using all kinds of metal.

W. C. Henderson said it seemed to him that Dr. Hunter simply proposed by another process to arrive at the same result already obtained by a different method, and it appeared reasonable to him. He some time ago had samples treated by the process, which treatment, if his memory served him, occupied three hours. He made analyses before and after treatment and found very much the same result as in annealing by the old process. The analysis, speaking from memory, he believed was about 3 per cent. combined carbon in the castings. The analysis after treatment of the surface to $\frac{1}{4}$ inch deep gave 0.04 of carbon. He then took a sample about one-quarter through and that, he thought, was about 0.053. Away down it was over 1 per cent. The castings, he thought, were about 2 inches thick.

Mr. Outerbridge said he thought the subject of much interest. He instanced what he said was a remarkable process of refining bullion by the passage of chlorine gas through the molten metal, which process, he said, was a complete

success. If the process of Dr. Hunter, by which chlorine gas was intended to remove rapidly the 3 or 4 per cent. of carbon in a casting, would do what was claimed for it, he thought it would be a great improvement on other methods. A question might be whether the casting was as dense as a piece originally cast of steel.

Messrs. Wood, Flagg, Davis, McHatton and others also took part in the discussion. Secretary Evans then announced that W. J. Keep of Detroit, Mich., an honorary member of the association, and who had presented a number of papers on "Keep's Test," of which he was the originator, was with them that evening and would, perhaps, address them.

Mr. Keep, in reply, jocularly remarked that he had afflicted the association about as much as it would stand, but that he did not do it intentionally and did not wish to do it again. Everybody was familiar, through the trade papers, with the Foundrymen's Association, and he was pleased to be among the company that evening. He thought the thanks of the public were due to the trade papers for publishing the proceedings of the meetings, and he was quite sure that if the association had not been formed the valuable papers read at their meetings would not have been prepared. He felt he could not say more, as there was only one subject on which he could talk, and all, he thought, that could be said on that subject had been said.

Mr. Wanner then said he would move that the secretary be requested to get some gentleman to prepare a paper on loam and dry sand molding. That, he believed, was an important branch of the foundry business and had not been considered at any meeting of the association. After discussion the matter was referred to the Executive Committee.

Mr. Wanner then, upon request, addressed the meeting on the subject of tariff and other conditions as applied to business. In the course of his remarks he said that he did not fear the tariff bill as it now stood, and he did not think it would affect any of their industries. As to its application, he considered the whole matter evolved itself into a question of wages and cost of production.

President Schumann on behalf of the association asked Mr. Keep to express his views as to the utility of the association. As Mr. Keep came from the West, he could no doubt give the opinions formed by the trade in that section. Mr. Keep in response said that personally he was exceedingly interested in the subject of foundry associations. Whether the Eastern or Western association would be the nucleus of a national society or not he could not say, but he believed such a society would eventually be formed, as had been the case with other organizations. He spoke of difficulties which might arise in the way of regulating the subjects for discussion, and the privacy which should attach to certain of them. He thought it was quite necessary that there should be an association of foundrymen, and he hardly believed there was room for more than one. He was confined to business to an extent which allowed of little chance to ascertain the views of other people on the subject. As far as he was concerned he looked upon this association's work with a good deal of interest, and he thought the other association would prove to be equally as good an organization when it reached the same age. The meeting then adjourned.

Open Hearth Steel.—III.*

The Hackney and Wailes Furnace.
—This furnace, Figs. 10 and 11, is working near Leeds, England, on a

others. It is an attempt to provide a means of repairing the ports without cooling the furnace down and is worth some attention. The producer gas and air are conducted into the furnace by means of square wrought iron tubes lined with $4\frac{1}{2}$ -inch silica brick, the tubes

three charging doors and two spouts for the early expulsion of the slag. The bottom is made up of magnesite mixed with tar and rammed with hot irons to form a solid bed on the cast iron plates and then well burnt magnesite bricks are carefully built in and leveled up under a high temperature with similar material, ground, and gradually fluxed. The magnesite has 58 per cent. of lime, 24 per cent. magnesia, 8 per cent. silica and 10 per cent. alumina and oxide of iron, and is, therefore, not of the best character. The silica walls

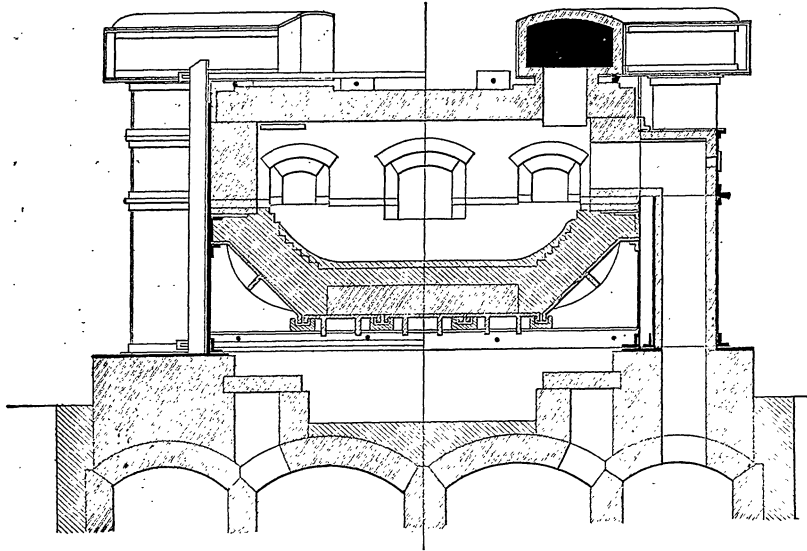


Fig. 10.—Vertical Section.

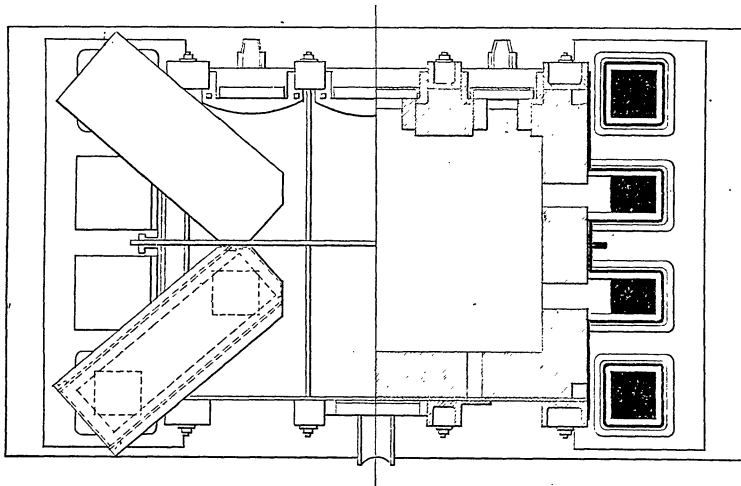


Fig. 11.—Plan and Horizontal Section.

Figs. 10 and 11.—THE HACKNEY AND WAILES FURNACE.

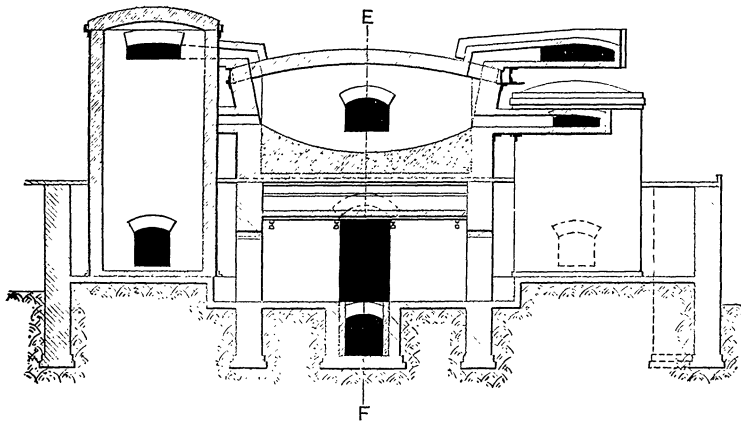


Fig. 12.—Longitudinal Section.

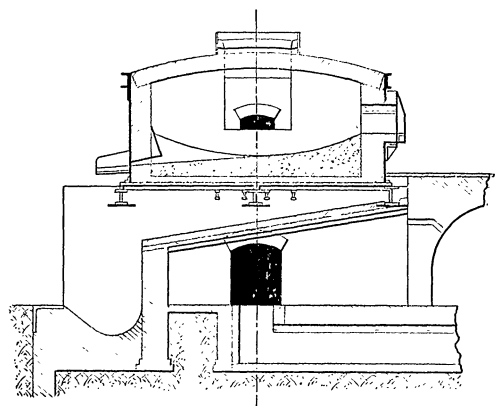


Fig. 13.—Section E F, Fig. 12.

Figs. 12 and 13.—THE RILEY AND DICK FURNACE.

basic hearth and the design, as far as the ports are concerned, is reproduced in those of Riley, Dick, Baths and

being completely separated from the body of the furnace. The air enters by the roof in a vertical line and impinges upon the stream of gas flowing immediately underneath. The furnace has

The Riley and Dick Furnace.—Figs. 12 and 13. The idea of separating the regenerators from the body of the furnace was originated by Siemens, who designed several applications of that

* See *The Iron Age*, November 15, page 851, and November 29, page 940.

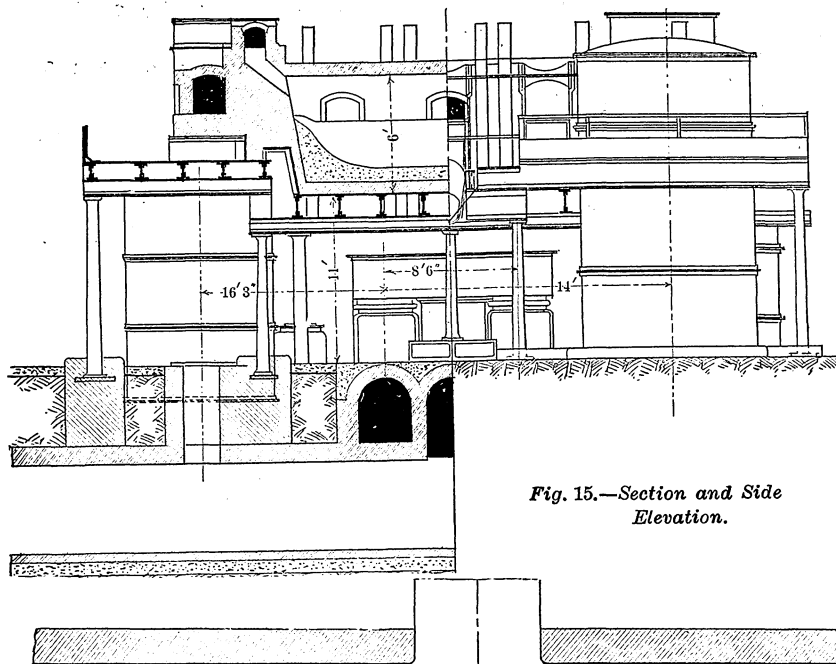


Fig. 15.—Section and Side Elevation.

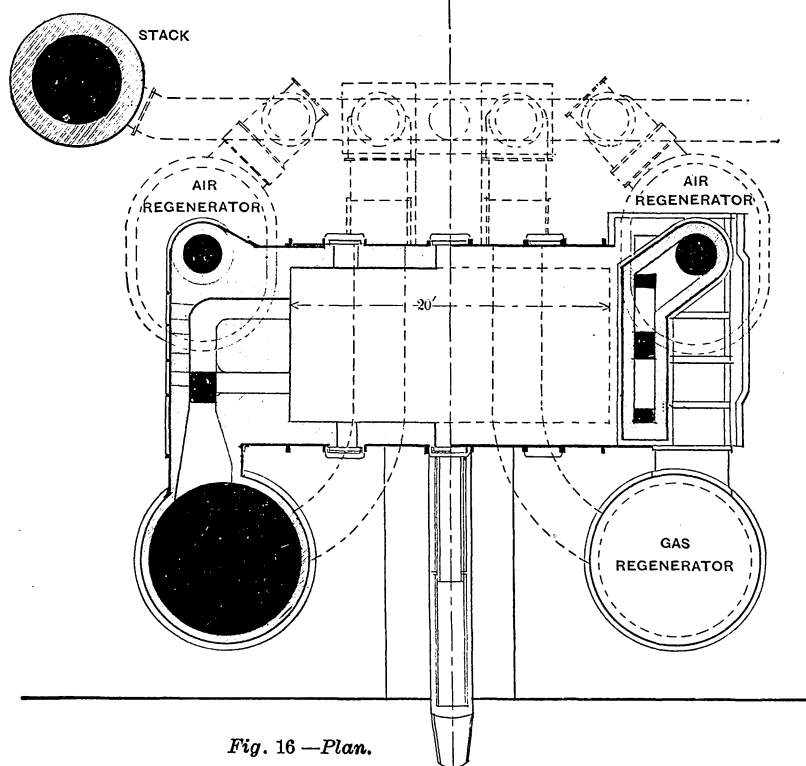


Fig. 16.—Plan.

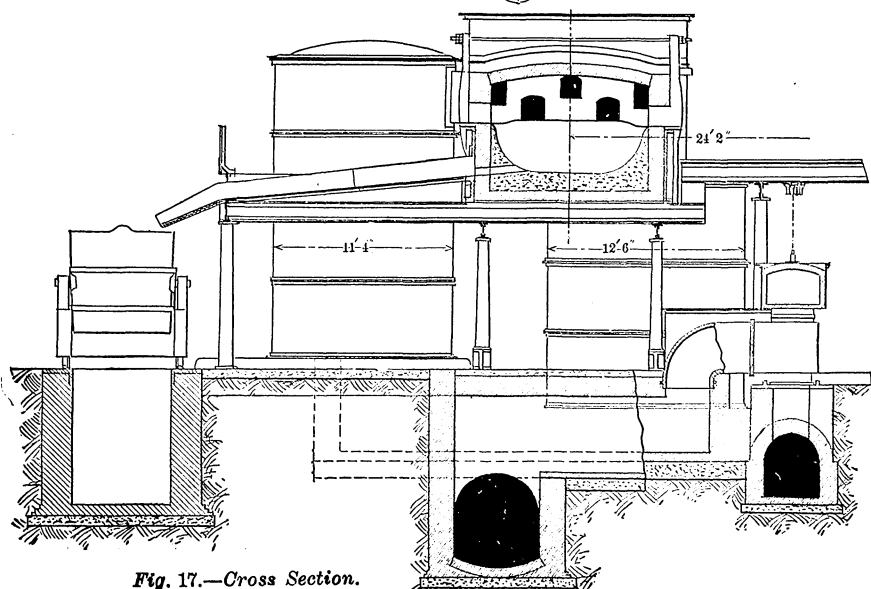


Fig. 17.—Cross Section.

Figs. 15, 16 and 17.—HILTON 25-TON FURNACE.

principle, but without commercial success. It appears that he recognized the value of such an arrangement, but he had difficulty in persuading the steel trade to accept the additional outlay it involved. But we believe that the idea of inclosing the regenerators in circular wrought iron chambers evolved from Riley and Dick, formerly of the Steel Company of Scotland. The furnace is circular, and is supported on a platform by beams or walling, and the regenerators are incased separately and stand in couples, one air and one gas, at each end of the furnace. By this means the bottom of the furnace is kept cool by the circulation of the air underneath; the regenerators are built purely as accumulating chambers, and not also as supports to an immense weight. The form of both the furnace and chambers permits their being incased more strongly and economically than does the flat sides of the ordinary Siemens furnace. The roofs of each of the circular structures are not fixed and may be removed intact when repairs are required, a particular advantage in the basic process especially. In the rare event of a charge breaking through the bottom the metal cannot find its way into the regenerators. The erection does not necessitate a deep excavation and valve pit, as the parts do not stand one on top of the other, but side by side. Finally, brick work repairs to the ports, furnace roof and checkers are carried out in a few hours without cooling down the furnace. As an example, the ring containing the furnace roof may be lifted off, refilled with brick work, and replaced long before the ordinary Siemens furnace could be cooled enough to receive the arch centers.

Further advantages may be justly claimed, but they are overbalanced by the one fact that the furnace has not been a success and in several places where the circular hearth was built a very short experience induced the manufacturers to alter them. It appears that the flame does not fill the furnace but simply travels from port to port, leaving the sides cool; its path, in fact, is too short for the bath of metal. Some question has been raised as to whether the spent gases find their way in equal proportions through the two regenerators, and whether the gas regenerator does not receive too large a share, but the draft is readily equalized by means of a pair of dampers in the flues, and there is no doubt that regenerators, separated as they are and connected to the ports by short tubes of the Hackney-Wailes type, are now an established success. This remark applies particularly to the basic process, in which the checker work is very rapidly filled up. These regenerators may be cooled, cleaned out and filled with checkers in about two days at the outside, while every one knows that the ordinary Siemens furnace takes three or four times as long. In first cost this arrangement compares very favorably with the Siemens furnace because the saving of brick work is so considerable.

The Batho-Wailes Furnace.—The faults of the Riley furnace being recognized it was an obvious improvement, while retaining all its principal features, to make the furnace an elongated oval. The self contained regenerators, the ports and connecting tubes, the removable furnace roof, are all reproduced in the Batho furnace,* and in the

* Drawings of this furnace are given by A. E. Hunt (Proc. Amer. Inst. M. E., 1888, Boston meeting). Wailes (Proc. Iron and Steel Inst. of England, 1887, II, p. 119), and Bernard Dawson (Proc. Mech. Eng., England, 1891, 1).

opinion of many steel makers it now forms the best melting furnace ever designed, especially for the basic process. The separation of the acid and neutral linings in the latter process is met by the arrangement shown in Fig. 14. As is well known, the continual renewals and repairs required by a basic lining are one of the chief difficulties in working the process, because the basic material at its junction with the acid sides of the furnace is continually eating away and bringing down the roof. In the design shown, the silica roof is inclosed in a ring which receives the thrust of the arch, and the whole is suspended independently of the walls by means of castings carried by the lower part of the furnace. The top of the wall of basic material is leveled off all round the furnace at a distance of about 15 or 18 inches below the spring of the roof, leaving a space which is closed by sections of silica brick hinged to the furnace, the lower joint being sealed with carbon and lime, and the upper with ganister. As the roof of a larger furnace cannot be freely removed this open side idea allows all parts of the furnace to be equally accessible from the outside. The thin layer of lime and carbon is found to be as perfect a separation as chrome ore, it having no weight to support.

This furnace is now being erected at Middlesboro, Ky., and a considerable number of them are to be found in Europe.

The Hilton Furnace.—Figs. 15, 16 and 17. The self contained regenerator, as applied to the rectangular furnace, is well illustrated by the Hilton furnace. It has a capacity of 25 tons of acid steel, or 20 tons basic, and is doing some first rate work. The gas regenerators are circular and communicate with the gas flue through unusually large passages and 36 inch double faced mushroom valves. The air regenerators are oval and are no higher than the level of the platform, the floor space of which, therefore, is not so much obstructed as in the preceding designs. There are two gas and three air ports, and as these are supplied sideways it is, perhaps, a question whether each port passes an equal quantity of gas or air, as the case may be, and whether a simpler type of block would not be better. The gas ports are slightly inclined downward, while the air ports are considerably inclined, to keep the flame off the roof. Each furnace has its own stack and more draft is required than in other furnaces. The cost of a 25 ton furnace is about \$3000 more than the ordinary Siemens furnace.

The Radcliffe Furnace.—Illustrations of this furnace may be found in the *Engineer*, Vol. LXII, page 462, and in the "Transactions" of the English Mechanical Engineers for 1891, and as the furnace has only a limited application it need not be further described here.

It was the first example, however, of a new type—that having overhead regenerators—and is to the present moment doing some remarkable work as regards economy of fuel at the Royal Arsenal, at Woolwich, England. It is a continuous regenerator furnace—that is, it has no reversing current—and consists of an apparatus for heating a forced draft, a gas producer attached to the furnace, a melting hearth and a series of pipe regenerators. The latter consist of properly supported pipes, through which passes the air for combustion in the furnace. The spent gases play around these pipes, heating the air to a considerable temperature

and then going to heat the blast for the producer in a similar way. The furnace is built entirely above the floor level, and the weight of the overhead structure, the regenerator chamber, is carried independently. It is argued in disfavor of these regenerators that the air tubes cannot be kept air tight, but we have watched the furnace at work, and allowing the cost of replacing the pipes to be considerable, it is still a fact that large quantities of steel are being produced by the pig and ore process

Drawing Office Appliances.*

BY A. WELLS ROBINSON, SOUTH MILWAUKEE, WIS.

The following description of a drawing board, easel and blue print frame is presented to the society as furnishing simple and inexpensive examples of these items of office equipment.

The drawing board shown in Fig. 1 has a top 36 x 54 inches, glued up with

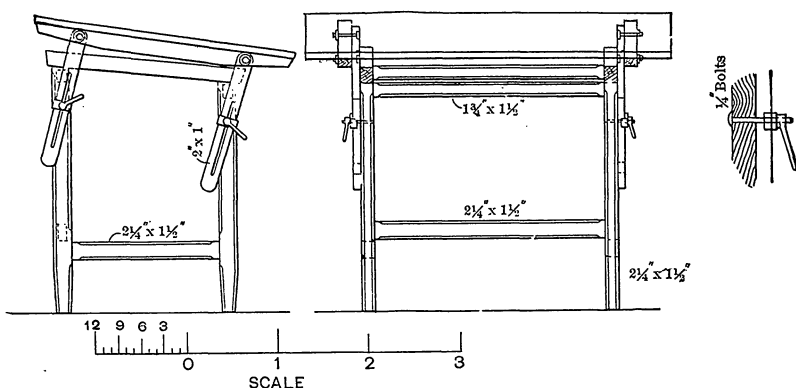


Fig. 1.—Drawing Board.

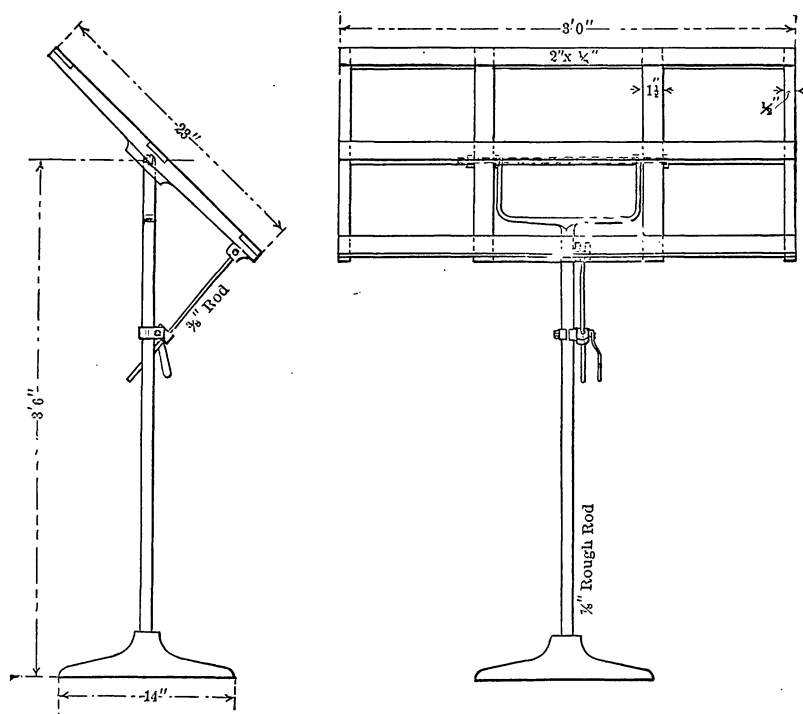


Fig. 2.—Easel.

DRAWING OFFICE APPLIANCES.

with under 784 pounds of fuel per ton of steel. The capacity is 20 tons.

The Department of State has received programmes of the international exhibition of hotel and traveling accommodations to be held in Amsterdam next summer. The scope of the exhibits will embrace a very wide field, including architecture, shipbuilding, railway construction and equipment, aerostatics, furniture, china and pottery, tableware, paper, blankets, and liquors, food, confectionery, fisheries, plumbing, medicine, machinery, electric lighting and signaling, gas and oil lighting, heating, art industries, geography, appliances, gardening, insurance and many other branches.

saw cuts on the back in the usual way. It is of this size to suit standard sheets 23 x 36 inches. The top is made adjustable for slope and height by the slotted supports, as shown. This allows every draftsman to suit himself in this regard. The lower frame and legs are of oak, neatly chamfered. These tables complete were made by a plain carpenter and cost \$7.50 apiece.

Each draftsman needs besides his board some convenient means of holding drawings for reference. The easel, Fig. 2, fills this need. A number of drawings can be attached to the top edge by spring clothes pins or clips, and turned over the backs as required. This

* Paper read at the December, 1894, meeting of the American Society of Mechanical Engineers.

easel was also "home made" and cost \$6 each.

The blue print frame shown in Fig. 3 is 25 x 38 inches inside. It is carried on two pairs of small grooved wheels attached to the side, and upon which it is reversible, as shown. The tightening of the back is done by three cross bars, pivoted at their centers. The ends of the bars engage with cleats screwed to the inside of frame at a slight angle, so that they wedge the bars to any desired pressure on the back. It is not considered necessary to provide for a double swing support so that the surface of the frame can be brought normal to the sunlight. This undoubtedly allows of quicker printing during morning and evening hours, but the saving is not great, and is obtained at the expense of simplicity. This frame cost about \$18, including iron track and plate glass $\frac{3}{8}$ inch thick.

Discussion.

C. J. H. Woodbury described a simple way of copying a drawing on ordi-

a smaller proportion of the essence of terebenthine. It is supposed that up to the present time no body possesses this remarkable property of liquefying when cold and solidifying when hot. It is true that certain substances, such as albumen, for example, harden when exposed to heat, but once they have attained this condition they cannot be made to resume the liquid state, although they may be subjected to exceedingly low temperatures.

Straightening a Leaning 100-Foot Chimney.*

BY J. C. PLATT, WATERFORD, N. Y.

It will perhaps be interesting to those having similar property, or to any who may have similar work to do, to know how a brick chimney 100 feet high, which leaned about 28 inches, was made plumb. This chimney is that of the Ormsby Textile Company of Waterford, N. Y. It was erected in 1893.

on which rests heavy stone work 10 feet high, 14 feet square at the bottom and 9 feet 6 inches square at the top. The weight of the foundation is about 149 tons, making a total of 355 tons resting on 196 square feet, about 1.8 tons per square foot.

Before commencing the work soundings were made on all sides of the proposed site. These varied from 20 to 38 feet in depth below the natural surface of the ground, and indicated the same character of soil as its surface, a soft, alluvial deposit with streaks of sand, but with no hard material or rock or boulders. The chimney was built upon this soil without the use of any piles. Two similar chimneys had been built in the immediate vicinity on what appeared to be similar material, and no trouble had been experienced with these. The bottom of the concrete is about 2 feet above normal summer level of the Mohawk River, but at the time of sounding in March it was submerged about 4 feet, it being found that the water rises and falls in the soil in the vicinity with the rise and fall of the river.

The work of straightening the chimney commenced on March 19, 1894. A scaffold was erected about the chimney and eight oak timbers, 6 x 10 inches x 10 feet, were placed vertically at the corners at a height of 42 feet above the stone work and 4 $\frac{1}{2}$ feet below the center of gravity of the brick work, the object of the oak timbers being to spread the bearing of the wire ropes over as large a section as practicable.

Wire ropes were passed around the timbers and another wire rope 2 $\frac{1}{2}$ inches in diameter, with an eye in each end, was fastened to the first mentioned ropes at its upper eye. The lower eye was connected with a system of pulleys secured to the dock at the river edge, at a point 78 feet distant and directly opposite the direction in which the chimney leaned, the pulleys being made up of three sets of double and single blocks connected together in series, having three points of fastening to the dock and having 11 pulleys in the system. Cables were also put out from the chimney on each side at right angles to the main cable and having turnbuckles to tighten them; also a guard cable in the rear.

The earth was then excavated on the high side of the foundation nearly half way around to the bottom of the foundation (a depth of 13 feet) and the main cable put under strain with the pulleys. By this means, in the course of three weeks, the chimney was brought back about 4 inches. Then, with a post hole digger 8 inches in diameter 11 holes were sunk vertically in the bottom of the trench around the foundation, principally at the highest point, to a depth of 5 $\frac{1}{2}$ to 6 feet. At this time the water in the river stood up to within 1 $\frac{1}{2}$ feet of the bottom of the foundation, the ground being soft to a depth of 4 feet; it then became very hard, showing that the strata supporting the chimney had been reached. No movement or flow of the soil was discovered until the eighth hole was sunk 4 $\frac{1}{2}$ feet and the tool withdrawn for clearance, when it could only be reinserted readily about 3 feet and headway made very slowly.

From this removal of the earth there resulted within a few hours a righting of the chimney to the extent of 5 inches. This increased to 8 inches by the next morning. The slack of the pulling rope was taken up as fast as the chimney moved, and the rope was kept under strain. By tightening up the

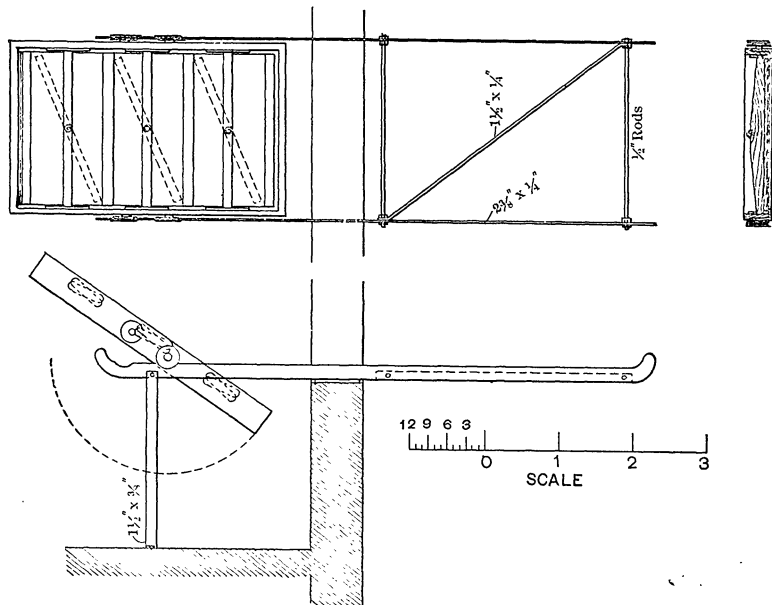


Fig. 3.—Blue Print Frame.

DRAWING OFFICE APPLIANCES.

nary white drawing paper. A hole is cut in a drawing board, and in this hole is inserted a glass plate. The hole is made of a size sufficient to cover the drawing to be copied, which is placed against the under side of the glass. An incandescent lamp is placed under the board, and is so arranged that its light falls on the drawing. The drawing paper is placed on top of the glass. The lines of the original drawing can be distinctly seen through the upper paper, upon which they can be accurately traced. A reflector should be arranged beneath the lamp.

It appears from the columns of our contemporary *Die Natur* that a German chemist has made the discovery of a new compound body, which is said to possess the peculiar quality of solidifying under the action of heat, and to again revert to the liquid state at a temperature below 32° F. To this substance the name of crostase has been given, and it is stated to be obtained by mixing equal parts of phenol, camphor and saporine, with the addition of

Soon after its completion it was found to be considerably out of plumb; and when first measured, in November, was found to lean about 16 inches, and a few days later 22 inches. Then the rate of increase of inclination became less, but in March, 1894, it was 28 $\frac{1}{2}$ inches out of line, and it was decided to attempt to straighten it. The factory to which the chimney is attached stands on the north side of the north outlet of the Mohawk River, and distant perhaps one-third of a mile from the west bank of the Hudson. The underlying rock in this part of the country is the Hudson River shale.

The chimney proper is rectangular in plan, is built of brick, is 9 feet 6 inches square at the bottom and 5 feet 4 inches square at the top; it is 100 feet high and has a central flue 3 feet square. The estimated weight of this is 206 tons. It stands upon a foundation which is 14 feet deep, the lower 4 feet being of concrete about 14 feet square,

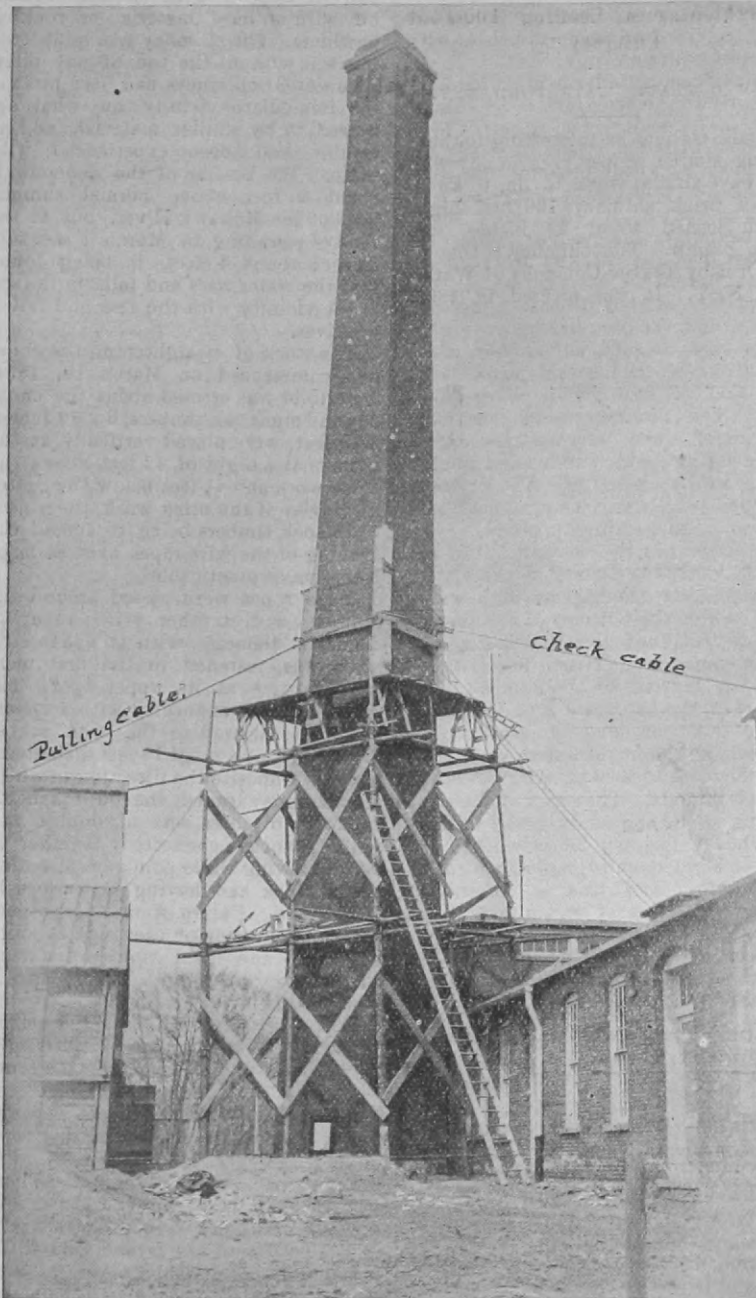
* From a paper read at the December meeting of the American Society of Mechanical Engineers.

pulley rope two or three times daily, in a week the chimney was brought back to 8½ inches.

At this point, in similar manner, the post hole diggers being reduced to 6 inches in diameter, about one-fifth as much more material was removed, immediately followed by righting the chimney to 4 inches, and from that point, after filling the holes with fine broken stone and gravel, thoroughly rammed, by continued daily strain on

they have purchased the business of the Sinclair Scott Mfg. Company, as they have only acted as their agents in the West in traffic arrangements for the past two years.

Ground has been broken at Lake Geneva, Wis., for the erection of the Yerkes telescope, the Chicago rival of the great Lick instrument of California. The site of the Yerkes Observatory is at an altitude of 1200 feet above sea



STRAIGHTENING A LEANING CHIMNEY 100 FEET HIGH.

the main cable, the chimney was brought back to plumb at the rate of ¼ inch per day. The turnbuckles in the side cables were occasionally used to control any tendency toward lateral inclination.

The work has been accomplished without injury to the structure. Time alone can tell whether it will permanently retain its position. It is stated that some chimneys as Louisville, Ky., which were straightened in a similar manner, have remained in proper position. This chimney settled in all 0.598 of a foot.

The Davis & Rankin Building & Mfg. Company of Chicago deny that

level and 630 feet above Lake Michigan.

State Factory Inspector Watchorn, in his annual report to Governor Pattison of Pennsylvania, shows a falling off in the number of persons employed in factories in that State during the year of nearly 16,000. During the last two months, however, there have been, he says, unmistakable evidences of a return to normal conditions. Mr. Watchorn strongly urges that the semi-monthly pay law in Pennsylvania should be rescinded and that the "sweating system" should be reached by more stringent laws.

The American Society of Mechanical Engineers.

FIFTEENTH ANNUAL MEETING.

At the opening of the session on Tuesday evening, M. N. Forney stated that the meetings held monthly last winter by members of the society had been very successful. The papers presented had been of a high character and formed valuable contributions to engineering literature. In addition the attendance had been such as to warrant the belief that meetings of this kind, of an informal character, were desirable. It was further pointed out that such meetings had been successfully held by other societies and that the mechanical engineers could adopt the custom with profit. Mr. Forney therefore proposed, and it was so voted, that the council appoint a committee of five to have charge of meetings to be held during the coming winter. This committee are to select the subjects for the several meetings, to formulate the rules for their guidance and to solicit contributions for defraying the expenses.

The first paper presented at this session was by Samuel Webber of Charlestown, N. H., and S. S. Webber of Trenton, N. J., on

Trial of a Vertical Triple Expansion Condensing Pumping Engine

at the Trenton Iron Works. The object of this test was to prove that the pump supplied by the E. P. Allis Company of Milwaukee to the Board of Public Works of Trenton, N. J., met the requirements.

The capacity and duty guaranteed by this contract were that the pumping engine should be capable of delivering into the reservoir, against a head of 120 feet, 10,000,000 United States gallons every 24 hours, and to do this at a speed of 30 revolutions per minute, and show a duty of 125,000,000 foot pounds for every 1000 pounds of feed water pumped into the boilers; steam to be supplied to the engine at a pressure of 110 pounds per square inch. No account was to be taken of the fuel consumption; it was, however, decided, for the sake of information, and from a desire to obtain as full data respecting the trial as could be had without special and elaborate preparation, to weigh all fuel used during the test, indicate the engine, take a record of steam temperature and pressure, and test the quality of the steam by calorimeter; and, so far as this was undertaken, the figures obtained are correct.

The principal dimensions of the engine and pumps are:

Number of steam cylinders, 3; diameter of steam cylinders, 20½, 36, 52 inches; stroke of pistons and plungers, 36 inches; diameter of piston rods (two at one end each piston), 2½ inches; area of piston rods (two at one end each piston), 4.43 square inches. Net area steam cylinders: High pressure, 325.63 square inches; intermediate pressure, 1013.44 square inches; low pressure 2119.29 square inches. Ratio of cylinders: High pressure, 1; intermediate pressure, 3.083; low pressure, 6.434. Cylinder clearances: High pressure, 2.05 per cent.; intermediate pressure, 1.97 per cent.; low pressure, 1.90 per cent. Number of water plungers (single acting), 3; diameter of water plungers 25½ inches; area of water plungers, 500.74 inches; displacement of each plunger per stroke, 18,026.64 cubic inches to

tal displacement of all plungers per stroke, 234.11 gallons.

The principal results are shown as follows:

Total foot pounds of work done in eight hours, 3,442,879,215; total number gallons pumped in eight hours, 3,451,015; equivalent number gallons lifted 119.62 feet per 24 hours, 10,353,040; foot pounds duty per 1000 pounds feed water, 136,233,000; foot pounds duty per 100 pounds coal burned, 129,090,000; foot pounds duty per 1,000,000 B. T. U., 117,800,000; pounds feed water used per indicated horse power per hour, 13.41; total indicated horse-power of engine, 235.70; value in horse-power of water pumped, 217.35; friction loss of engine and pumps in horse-power, 18.35; percentage of useful effect, 92.3 per cent.; gallons pumped per 24 hours (in terms of contract), 10,113,680; foot pounds duty per 1000 pounds feed water (in terms of contract), 133,856,000; foot pounds duty over and above terms of contract, 8,856,000.

The boilers were of the horizontal tubular type, with dimensions as follows: Number of boilers, three; diameter of shell, 54 inches; length of shell, 15 feet; number of tubes, 48; diameter of tubes, 3 1/4 inches; heating surface each boiler, 779.10 square feet; grate area each boiler (54 x 54 inches), 20.25 square feet; ratio grate area to heating surface, 34.17; kind of grate: Tupper, set 28 inches below boiler; smoke flue for three boilers, 36 x 36 inches.

The next paper was by Profs. C. H. Peabody and E. F. Miller of the Massachusetts Institute of Technology on "Test of a Triple Engine at the Massachusetts Institute of Technology." A former paper gave at length the manner of making tests and calculating results in vogue at the Institute and the precautions employed to avoid errors. From the present paper we quote the last paragraph as follows: "Two remarkable and to us unexpected conclusions appear to come from our tests on jacketing: 1, that there is comparatively little effect from jacketing the heads of the cylinders of our engine; 2, that the gain from jacketing is less for very short cut-off than for a cut-off at 30 per cent. on the high pressure cylinder, at which our engine finds its minimum consumption."

Two papers presented by F. W. Dean of Boston were read and discussed together. The

Trial of a Leavitt Pumping Engine

described the test of an engine of the Leavitt type built for Louisville, Ky. The engine ran 144 hours and 10 minutes without a stop, which is the longest test run on record, and established itself as the most economical compound engine that has ever been tested, so far as the writer knows. The result is phenomenal and is of great interest at the present time on account of tests of some recent high expansion engines with cylinder ratios of 7 to 1, an account of one of which the writer gives in another paper (here following). It also has great interest in showing how closely reached by this engine are the records of many triple expansion engines. The writer believes, however, that a triple expansion engine designed on the same lines will lower the steam consumption by a paying percentage.

The engine has two vertical inverted cylinders, the piston rod of the high pressure cylinders being connected by links to one end of a beam and the low pressure similarly to the other end of

the beam. The main shaft is at one end of the engine, and the connecting rod passes from a pin in the upper part of the beam to the crank pin. The steam pistons have opposite motions in consequence of this arrangement, and the exhausts from the ends of the high pressure cylinder pass to the corresponding ends of the low pressure cylinder. There are two reheating receivers between the cylinders composed of small brass tubes, inside of which is live steam of boiler pressure, the exhaust steam passing in contact with the outside of the tubes. Both cylinders are steam jacketed on heads and sides with steam of boiler pressure.

Each steam cylinder is provided with four gridiron valves operated by Leavitt cams. The point of cut off in the high pressure cylinder is automatically determined by a ball governor, but that of the low pressure cylinder is fixed. The engine is of the most massive character, the weight being far greater than that of any other pumping engine of the same capacity. The pumps are located directly under the engine, and the plungers are connected to the beam at such points that, while the stroke of each steam piston is 10 feet, that of each pump plunger is 7 feet. The plungers work vertically and are of the differential type, being single acting on the suction and double acting on the discharge. The engine is provided with a surface condenser and vertical double acting air pump.

On account of the rise and fall of the Ohio River the bed plate of the engine is placed above the highest high water mark, while the bottoms of the pumps are sufficiently low to take water at the lowest stages of the river. The distance from the bottoms of the pumps to the bottom of the bed plate is 61 feet.

The trial consisted of ascertaining the duty by weir measurement at the reservoir and nearly or quite all other data of interest. That part of the trial relating to the engine only will be here described. The engine is worked by steam of 140 pounds gauge pressure at the boilers, and this is conducted through 180 feet of steam pipe, well covered, to the engine. At the engine the total per cent. of condensation in this pipe and priming of the boilers amounted to 2 5/8 per cent., and all of

one revolution of engine, 660.30 gallons; diameter of each discharge pipe, 24 inches.

Steam Used by Engine.—Moist steam used per hour, per indicated horse-power, 12,223 pounds; dry steam used per hour, per indicated horse-power, 12,156 pounds; dry steam used per hour, per indicated horse power, by inner cylinders, 10,120 pounds; moist steam used per hour, per pump, horse-power, 13,125 pounds; dry steam used per hour, per pump, horse-power, 13,050 pounds. Prevailing point of cut-off high pressure cylinder, 20.20 per cent.; prevailing point of cut-off low pressure cylinder, 42.10 per cent. Steam accounted for by indicator at high pressure cut off in per cent. of 10,120 pounds, 7.75 pounds equals 76.58 per cent.; steam accounted for by indicator at high pressure release, 9.166 pounds equals 90.57 per cent.; steam accounted for by indicator at low pressure cut-off, 10,008 pounds equals 99.60 per cent.; steam accounted for by indicator at low pressure release, 9.725 pounds equals 96.09 per cent.

Average Powers.—Horse-power developed by high pressure cylinder, 279 horse power; horse-power developed by low pressure cylinder, 364.40 horse-power; horse-power developed by both cylinders, 643.40 horse-power; percentage of power in high pressure cylinder, 43.36 per cent.; percentage of power in low pressure cylinder, 56.64 per cent.

Duties Based Upon Plunger Work.—Plunger work performed in 144 hours 10 minutes, 171,015,314,960 foot pounds; duty per 1,000,000 B. T. U. used by engine alone, 138,126,000 foot pounds; duty per 1000 pounds moist steam used by engine alone, 150,838,000 foot pounds; duty per 1000 pounds dry steam used by engine alone, 151,672,000 foot pounds; duty per 100 pounds dry Pittsburgh coal, 125,444,000 foot pounds; duty per 100 pounds dry Pocahontas coal, 139,031,000 foot pounds; duty per 100 pounds dry Pittsburgh combustible, 129,295,000 foot pounds; duty per 100 pounds dry Pocahontas combustible, 145,762,000 foot pounds.

This engine is, both in design and results, in striking contrast with the Rockwood system engine described in the writer's following paper, as shown in the table:

Engine.	Leavitt.	Rockwood.
Steam pressure absolute.....	151.60 pounds.	175.50 pounds.
Vacuum.....	27.75 inches.	25.3 inches.
Ratio of expansion.....	20.40	33.00
Number of revolutions per minute.....	18.57	76.4
Length of stroke.....	10 feet.	4 feet.
Piston speed per minute.....	371.5 feet.	611.2 feet.
Cylinder ratio.....	4 to 1	7 to 1
Drop between cylinders.....	None.	About 14 pounds.
Dry steam per indicated horse-power per hour.....	12.156 pounds.	12.34 pounds.
Difference in favor of Leavitt.....	0.684 pound = 5.3 per cent.	

this but 5/8 of 1 per cent. was thrown out by a separator. The steam pressure at the engine near the high pressure cylinder fell to 137 pounds by gauge.

The leading dimensions of the engine are: Diameter of high pressure cylinder, hot, 27.21 inches; diameter of low pressure cylinder, hot, 54.13 inches; diameter of fly wheel, 36 feet; diameter of high pressure piston rod, 5 1/2 inches; diameter of low pressure piston rod, 6 inches; stroke of each piston, 10 feet; mean clearance of high pressure cylinder, 1.585 per cent.; mean clearance of low pressure cylinder, 1.530 per cent.; diameters of each differential plunger, 34 inches and 24 1/8 inches; stroke of each differential plunger, 7 feet; mean ratio of steam piston areas, 4.015 to 1; volume displaced by plungers during

This comparison shows very clearly that the ratio of 7 to 1 does not necessarily produce as economical results as a ratio far removed from it, even with the additional advantages of 24 pounds more steam pressure, 1.6 times as many expansions, four times as many reciprocations per minute, and twice as great piston speed. It tends to show that no advantage arises from a drop in pressure between the cylinders, if evidence were needed of this.

It is the writer's opinion that in order to use steam in the most economical manner in a multiple expansion engine, the expansion must be continuous throughout the series of cylinders (that is to say, there should be no drop between the cylinders), and that compression should be carried up to the

initial pressure in each cylinder. These features have been employed to the fullest extent in the Leavitt engine which forms the subject of this paper, and the result has surpassed all records for economy of engines of its class.

The second paper by Mr. Dean was entitled

Trials of a Recent Compound Engine with a Cylinder Ratio of 7 to 1.

The engine tested was built by the Wheelock Engine Company of Worcester, Mass., and is located at the Natick Mills of B. B. & R. Knight of Providence. The engine embodies what is known as the Rockwood system, and is of the following dimensions:

Diameter high pressure cylinder, hot, 18.44 inches; diameter low pressure cylinder, hot, 48.50 inches; diameter high pressure piston rod, 3.25 inches; diameter low pressure piston rod, 4.25 inches; stroke of both pistons, 48 inches; mean ratio of piston areas, 7 to 1; mean high pressure clearance, 2½ per cent.; mean low pressure clearance, 2½ per cent.

The engine is a horizontal cross compound, with the high pressure cylinder jacketed all over, and the low pressure cylinder on the heads only. There was a reheater between the cylinders. In the writer's judgment the jackets were badly piped, and it is doubtful if the jacket circulation was good. The reheater was quite deficient in heating surface. The condenser was of the injector type, made by the builder of the engine. The vacuum was defective, although very cold water was used. The engine was 400 feet from the boiler, which was of the Babcock & Wilcox make, but as the pipe and flanges were well covered the condensation was not excessive. Examination showed the pistons and valves to be tight. Although five different tests were made the paper quotes but two. The following is a tabulation of the results:

	Date, 1894.	
	January 26, p.m.	January 27, a.m.
Duration of trials.....	4½ hours.	5 hours.
Average steam pressure near engine.....	159 pounds.	158 pounds.
Average vacuum.....	25.4 inches.	25.2 inches.
Average ratio of expansion, by volumes.....	33.6	33.4
Average number of revolutions per minute.....	76.857	76.603
Average piston speed, feet per minute.....	610.86	612.82
Per cent. of moisture in steam near cylinder..	1.90 per cent.	1.75 per cent.
Total dry steam used.....	34.089 pounds.	37.677 pounds.
Average indicated horse-power.....	194.79	582.21
Dry steam used per indicated horse-power per hour.....	12.74 pounds.	12.94 pounds.
Average dry steam used per indicated horse-power per hour.....	12.84 pounds.	

It will be seen that these results show a very economical use of steam, and far less than has heretofore been thought possible with compound engines. If the vacuum had been 28 inches the steam consumption might have been as low as 12.36 pounds on January 26, p.m., and 12.60 pounds on January 27, a.m., if this had not given rise to any unfavorable set of thermodynamic conditions. The average of these two is 12.48 pounds. The paper presents diagrams from the engine and concludes as follows: "Although the performance of the engine is remarkably good, the writer believes that it was realized in spite of great defects, and that it would have been much better if these alleged defects had not existed. The economy, in the writer's judgment, is due to high steam pressure with the resultant high degree of expansion, small clearances and tight pistons and valves."

Discussion.

In discussing these two papers G. I. Rockwood said, in part:

"To define the Natick engine as simply as possible, it is a triple expansion with the intermediate cylinder omitted and with an intermediate receiver substituted therefor. Mr. Dean makes out an apparent advantage in favor of the Louisville engine of 5.3 per cent. I ask is this figure to be taken as representing the true comparative economies of the two types of compound engine? I believe it is not, and for the following reasons, partly specific and partly general: At the trial of each engine the M. E. P. referred to the low pressure cylinder, and the degree of vacuum was, Louisville engine, 24.9 pounds M. E. P. and 13.4 pounds vacuum; Natick engine, 17.46 pounds M. E. P. and 11.9 pounds vacuum. If the load on the Natick engine could have been enough more to have made use of a vacuum of 13.4 pounds instead of only 11.92 pounds, and this decrease in back pressure of 1.5 pounds could have been effected and so added to the M. E. P. of 17.46 pounds, as is entirely possible, and as we should now do on paper, and if the proper effect of the better vacuum on the economy of the Natick engine is to be understood, then $(1.5 \div 17.46 = 8.6 \text{ per cent.})$ 8.6 per cent. more work done by 12.74 pounds of steam would immediately result. The quantity of 12.74 pounds is now 108.6 per cent. of the amount necessary to do 1 horsepower of work; so 100 per cent. would be $12.74 \div 108.6 \times 100 = 11.75$ pounds steam as the true comparative economy of the Natick engine, as against 12.16 pounds, that of the Louisville engine, a difference in favor of the Natick engine of 3.5 per cent. I will not try to estimate the harmful effect on the Natick engine duty of poorly piped jackets, insufficient brass tube area in the receiver jacket, or the error in determination of its actual performance, due to leakage of steam from the main

Natick engine—improved upon by itself, as it doubtless could be, several per cent.—is not unsatisfactory enough to warrant an impeachment of its design, especially when four other engines of the same type have all given equally good or better accounts of themselves, whereas we cannot with certainty get a plain compound Corliss mill engine to do as well as 14 pounds, try as we will."

A third paper by Mr. Dean described a method of changing the suction system of a pumping engine. Until recently the water works engines of Taunton, Mass., raised water 21 feet by suction from a basin fed by springs along the edge of the Taunton River. The new supply comes in under a head and the system described is so arranged that the engine can either take the water as before from the old basin, or under a head from the new supply.

A paper by Profs. Gaetano Lanza and E. F. Miller of Boston on "Tests of Spruce Columns" gave the results of 13 tests of spruce columns made on the Emery testing machine at the Massachusetts Institute of Technology. The spruce was of a fair average quality, just as is ordinarily sold for building purposes, and was fairly well seasoned.

Compression Spruce Columns.

Weight.	Size of column.			Ultimate strength.	
	Length.	Width.	Depth.		
Lbs.	Ft.	In.	In.	Lbs.	
228	17	.0	8.00	8.00	155,000
237	15	.0	10.00	10.00	261,500
182	11	1.00	8.13	8.13	180,000
128	9	0.13	8.13	8.13	191,500
100	7	6.00	8.13	8.13	170,800
133	9	6.38	8.13	8.13	175,700
66	7	8.38	7.75	7.75	191,900
66.5	5	9.75	7.88	7.88	156,400
104	7	11.00	8.25	8.25	175,400

Four papers having the following titles were read by Charles T. Porter of Montclair, N. J.: "Comparison of the Action of a Fixed Cut-off and Throttling Regulation with that of the Automatic Variable Cut off, on Compound and Triple Expansion Engines;" "Description of a Cam for Actuating the Values of High Speed Steam Engines;" "Description of an Improved Steam Separator and an Improved Steam Jacket," and "Description of an Improved Centrifugal Governor and Valve." These papers describe a new engine designed by Mr. Porter. As this engine was fully described and illustrated in *The Iron Age* of May 3, 1894, it is not necessary to present them here.

Development of Electric Railways.

From this paper, by C. J. Field of New York, we take the following remarks about underground conduits, or the placing of the trolley wire with all its feeders under the surface of the street. This, the author states, is the ultimate and desirable result to be obtained in our large city lines of electric traction, and cities are going to demand in the near future this method of service where the local conditions and requirements will warrant it. Underground conduits were attempted four or five years ago, but on account of insufficient experience, lack of engineering ability, or amount of money expended on the work, as well as a desire on the part of the company installing them to make them a failure, they were not in general successful. The first really successful underground conduit to be installed and operated was in Budapest, about 7 or 8 miles in length, and it is now being extended to 30 miles or more.

The local conditions there were favorable, and the width of slot opening which was possible to be used there was not practicable in this country, owing to our wagon tires. We have had the past year one or two conduits introduced on similar lines in this country on a very small scale, at Chicago and Washington, and we will have within the next few months the introduction of a conduit, in one or two of our large cities, on a large commercial scale. The conduit to be most used will be one similar to a cable conduit, with the trolley conductors placed at the sides in the shape of a channel or angle bar or rod of iron or copper, which will be divided into sections and fed by underground feeders laid along the line of the road. Various types of shoes or brushes will convey the current from the trolley wire to the motors on the car. Such a conduit, we believe, will only be successful where it is made a double trolley conduit, and not depending on the track for the return circuit.

The other type of conduit which may be used is one of the several which are operated on the closed conduit plan. None of these has been introduced on a commercial scale as yet. It is a very attractive method in many ways, also saving on the cost of construction of a cable conduit. There are numerous difficulties in regard to the electrical details which will have to be overcome before such a form of duct can be a success. The overhead line construction, though, will continue to be used in the majority of cases for many years to come, we believe, as the most practicable and best method for conveying the current to the motors. The cost of a well built trolley conduit in the form of a cable duct will, in most cases, exceed that of a cable duct on straight track, but less on curves and special work.

Discussion.

G. C. Henning described a conduit which had been built and successfully operated by Siemens & Halske. It consists of an inverted trough or box about 8 inches deep. The conductor is placed along the top. At certain points the trough is divided by transverse diagrams or partitions. The conductor passes through these partitions, and at these points it is, of course, carefully insulated. Inclined guide bars are so placed as to carry the trolleys, of which there are two, beneath the lower edges of the partitions. The trolleys are pressed upward against the conductor by springs, the trolleys' arms being shaped somewhat like the letter J. The wheels are placed at such a distance apart that the forward one will, when passing a partition, be in contact with the conductor before the rear one leaves the conductor. This construction is intended to avoid sparking. The grade of the road governs the spacing of the partitions; on level or nearly level ground they are not so near together as on steep grades. The trough acts upon the same principle as the diving bell, and it is therefore impossible to fill it with water. Water entering the conduit is prevented from reaching the conductor by reason of the air in the trough between the partitions.

Effect of Clearance on the Economy of a Small Steam Engine.

By Prof. G. W. Bissell of Ames, Iowa. In this paper are presented the results of experiments made upon a small throttling slide valve steam engine. The primary object of the ex-

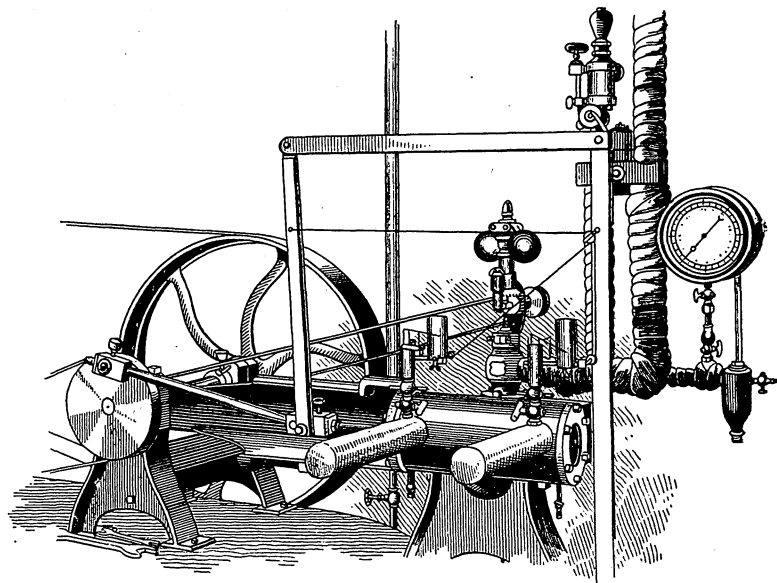


Fig. 1.—Engine Arranged for Test.

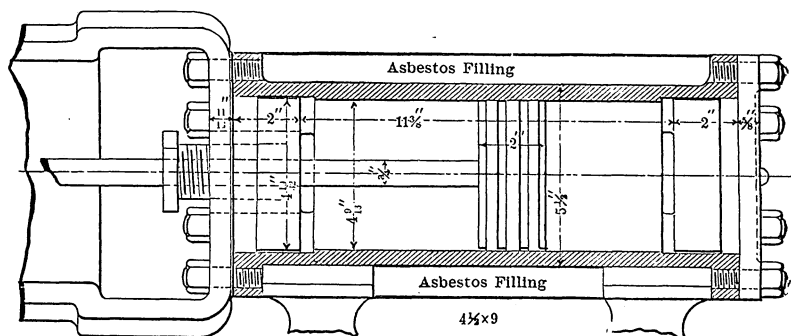


Fig. 2.—Vertical Section through Cylinder.

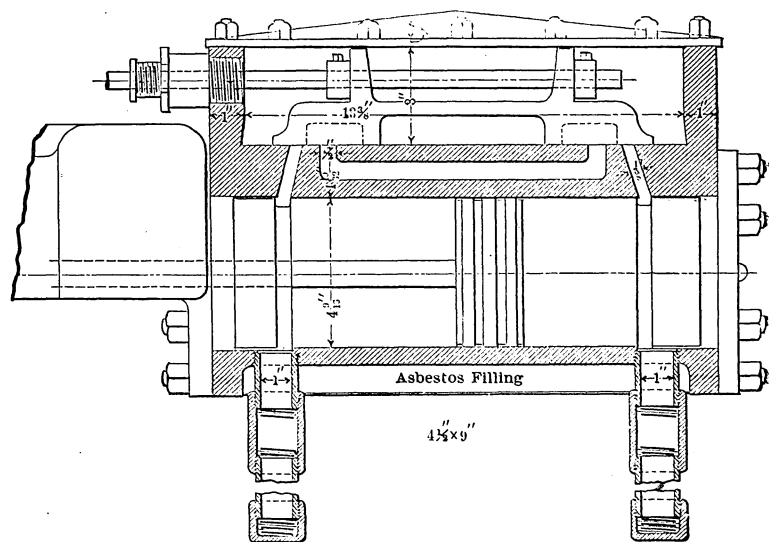


Fig. 3.—Horizontal Section through Cylinder.

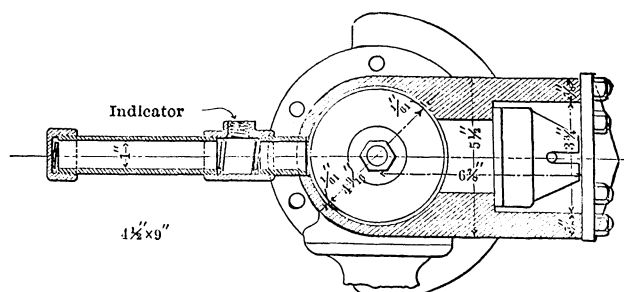


Fig. 4.—Cross Section of Cylinder.

EFFECT OF CLEARANCE ON ECONOMY OF A SMALL STEAM ENGINE.

periments was to determine the effect upon the economy of the engine of varying the volumes of the clearance spaces at the ends of the cylinder, and the secondary object to determine the variation of the economy of the engine with varying load for each of the several magnitudes of clearance. The method employed consisted in making five series of experiments, one for each of five clearance magnitudes. Each series consisted of five economy tests conducted according to approved methods, the load being maintained constant for each test, but being varied throughout the series. From the data of the experiments two sets of curves were plotted; one showing the variation of economy with load for each of the five series, and the other exhibiting the relation of economy to clearance magnitude for four different values of horse-power.

The engine was a throttling slide valve engine, $4\frac{1}{2} \times 9$ inches, built at the shops of the Iowa Agricultural College, and used for several years to drive the machine shop of the same institution. Fig. 1, from a photograph, and Figs. 2, 3 and 4, from drawings, show the construction of the engine and the details of the cylinder and steam chest.

Owing to the small size of the cylinder, it was decided to provide for increasing the clearance volume by retapping the indicator hole for 1-inch pipe and inserting therein pieces of 1-inch pipe of sufficient length to give the required increase. The construction is shown in Figs. 1, 3 and 4. The several clearance volumes thus obtained were as follows:

	Head.		Crank.		Average.
	Cubic inches.	Per cent.	Cubic inches.	Per cent.	Per cent.
Piston displacement.....	147.14	100.00	143.17	100.00	100.00
Original clearance.....	11.80	8.02	12.40	8.53	8.27
Clearance for second series.....	16.48	11.20	17.08	11.92	11.56
Clearance for third series.....	20.54	13.95	21.14	14.78	14.36
Clearance for fourth series.....	25.54	17.35	26.14	18.28	17.82
Clearance for fifth series.....	28.65	19.41	29.25	20.42	19.91

The paper presents a log of each test and states that by way of conclusions from the results of the test, we see that, for this engine, the maximum economy at all loads is obtained with a clearance of about $14\frac{1}{2}$ per cent., and that the economy increases with the load, although not in direct proportion.

Other papers read during the meeting were: "On the Theory of the Moment of Inertia," by Prof. C. V. Kerr of Fayetteville, Ark.; "Results of Measurements to Test the Accuracy of Small Throttling Calorimeters," by Prof. D. S. Jacobus, Hoboken, N. J.; "Experiments on a System of Governing by Compression," by Prof. J. H. Barr, Ithaca, N. Y.; "Strength of Railway Car Axles," by Prof. L. S. Randolph of Blacksburg, Va.; "A Graphical Method of Designing Springs," by G. R. Henderson of Roanoke, Va.; "Rail Pressures of Locomotive Driving Springs," by D. L. Barnes of Chicago; "Counterbalance in Locomotive Drive Wheels," by Prof. W. F. M. Goss of Lafayette, Ind.; "Stresses in the Rims and Rim Joints of Pulleys and Fly Wheels" and "Application of Brakes to the Truck Wheels of a Locomotive," both the latter by Prof. Gaetano Lanza of Boston.

An abstract of the paper by W. J. Keep of Detroit, on "Relative Tests of Cast Iron," and also the discussion it elicited, will be presented in a subsequent issue.

Surface Defects in Ingots.

BY J. S. ROBESON, PITTSBURGH.

What may be called physical, in contradistinction to chemical, causes often operate to produce flaws and surface imperfections in steel slabs or blooms. These cracks open during the blooming of the ingot, and in many cases are so deep as not to be removed during the subsequent rolling. They then prove so disastrous as to cause the finished steel to be rejected on their account, or, if accepted, to be taken only as second-class material.

In the following remarks on this trouble it is presumed that the steel contains the usual metalloids and other impurities in such proportions as will permit of successful rolling, and that the conversion, except as regards temperature, has been properly conducted. While the method of conversion (be it by any of the four methods most widely used to-day—i. e., the acid Bessemer or open hearth and the basic Bessemer or open hearth) and the grade of the steel produced, unquestionably have a bearing on these cracks, still the study of them and the suggested means for their elimination, may be taken up regardless of the grade, or the special method of conversion used. The following remarks will bear on this trouble in a greater or less degree, as the process used, and the grade desired, give the maker greater or less trouble in this way. For instance, steel made by the basic open hearth method gives,

formed serving as starting points. If, on the other hand, the blooms are to go into plates, as is usually the case in this country with basic open hearth steel, they are finished thinner, not nearly so square as those for rails, &c., and the flaws on the thin edges do not cause so much harm, nor is there the same tendency to further tear the cracks, as is shown in the shape rolling.

It is plain, however, that these cracks are the cause of trouble, whatever use may be made of the steel. Their very existence has in some cases militated severely against the use of direct rolling—i. e., finishing without reheating the blooms. The reheating removes many of these cracks, since the bloom being much hotter, and more uniformly heated, than when rolled direct, the metal flows more freely and removes the flaws by drawing them out without tearing, and in some cases by welding the surfaces together.

These cracks may again, to a certain extent, be removed by chipping. Where the blooms are to be finished at once they are often swung while hot, directly from the shears, under a steam hammer, and many of the cracks cut out, or, if allowed to cool off, are carefully examined, being turned over and over, and all the cracks and flaws cut out with broad-nosed gouges. Work of this sort is slow and expensive, and adds considerably to the cost of the finished steel.

From a study of the appearance of these cracks, as they develop during the passes under the blooming rolls, it has been noticed that they are of four distinct types:

1. Large, deep, V-shaped cracks with sharp clean edges, appearing on any of the four sides of the ingots, but seldom on the edges, and at varying distances from the top and bottom. In ingots of about 18×20 inches each leg of this V may at times be from 3 to 6 inches long. Such flaws often appear on ingots that otherwise are perfectly clean and smooth.

2. Large masses, or groups, of small diamond shaped holes, appearing principally on the two sides of the ingot that are not subjected to the pressure of the rolls in the first pass. A few breaks may occur on the edges, and, if the sides, already mentioned are very badly marked, a smaller number of cracks usually develop on the other two sides, during the subsequent rolling. In ingots of from 60 to 75 inches long, they appear about 10 inches from the top end, and occur over a space of from 10 to 20 inches in length. These flaws are but slightly noticeable during the first few passes, but rapidly increase in number, though not in size, during the rolling, thereby differing from the V-shaped cracks. They become very marked and easily seen as the piece approaches completion, then resembling the links in chain armor. This appearance can be best noticed on steel that is rolled into beam blanks, or blooms of about 10×8 or 7×8 inches.

3. Small, ragged breaks, appearing on one or at the most two edges of the ingot, usually near its middle, with possibly similar marks on the sides. These sometimes appear like overlapping scales along the edges, but the characteristic of this defect is its location.

4. Usually known as scabs. These may exist on any side, or edge, of the ingot, and are more noticeable when the bloom or slab is cold than during the rolling. In some cases, and these are the true scabs, the piece becomes loose during the rolling and falls or is pulled off of the ingot, leaving a hole or scar,

perhaps, the least trouble from cracks during the rolling, because the greater part of such metal contains but a small amount of the metalloids and other impurities (it being low in carbon, silicon, sulphur, phosphorus and manganese) and many of the cracks, that would otherwise develop therefore weld together during the rolling. Other causes, such as the slower work of such a plant, also tend to obviate some of the evils that beset the maker of a higher carbon steel. As an example, all of the rail steel in this country is made in fast running acid Bessemer plants. Here the maker not only finds that these cracks will not so easily weld together, on account of the higher percentage of metalloids and other impurities present, but that many details of his practice tend to further augment the trouble. And again, when the ingot is to be rolled into a complex form, as a rail or a beam, these flaws become of more serious moment, since it is almost impossible to roll them out, and they invariably appear so prominently in the finished article, as to cause it to be classed as a "second." Owing to the form of these articles, a crack on any one of the four sides of the ingot is liable to cause this trouble; and again, owing to this very form, the evil results of these cracks are increased, since the severe strain and distortion, put on the metal during the rolling, tend to further tear the steel, the fractures already

which the subsequent rolling often removes. In the majority of cases, however, one end of this small piece is welded fast, the loose end being rolled down and into the bloom. When cold, this defect has much the appearance of a fin on the body of a fish. The line of separation between the loose piece and the bloom can be plainly seen, but it is extremely difficult to chip out a defect of this kind, since it runs into the metal, becoming a part of the main mass, and the result of any attempt of this kind is a deep and unmanageable scar.

From the study of the published literature on this subject, and especially of the valuable notes by Caspersson on the effect of the temperature of casting on the location and number of blow holes, it is evident that many of these cracks and surface defects, especially those included under the heads of Nos. 2 and 3, are produced by the breaking open of blow holes. The fact that such blow holes break open, shows that the force expended on the ingot during the blooming is sufficient to tear the steel, if the skin be thin, or, in other words, if the blow holes are located near the surface. This draws attention to a factor which can only be lightly touched upon at this time—*i. e.*, the effect of two-high or three-high mills, and the differing results from differing amounts of draft on the surface of the steel. In the rolling of other metals—and this, I believe, is especially true of gold—it has been found that when the earlier passes were the heaviest, the tendency to break and tear the metal was greatest; whereas, on the other hand, if these earlier passes were made the lightest, and the draft was gradually increased as the metal neared the desired form, the material showed no indications of breaking, but, on the contrary, rolled perfectly smooth. Now, while the conditions are very dissimilar in the two cases, still, acting on this suggestion, which was made to me by A. E. Ford some years ago, I have found that, when working with a two-high mill, where it was possible to vary the draft at will, ingots, which were rolled in accordance with this gold theory, gave very many more smooth and perfect blooms than those which were rolled in accordance with the usual practice of the mill. This usual practice is, I think, almost universal, and is based on the idea that the steel being hotter when it first comes to the mill, it will then better stand a heavier draft, because it is presumably softer; and also, since less steam is then required to take this draft than is the case when the piece is smaller in section, but greater in length. In many cases, where the steam supply is limited, this method of procedure is imperative. The nearer the blow holes to the surface, the more easily will they be opened by the pressure of the rolls, hence, heavy drafts in the first few passes will open up, or tear apart, such blow holes as may be too near the surface, whereas, on the contrary, if these earlier passes be made light, the metal being hot and soft, there is a greater tendency to elongate the blow holes, and the ingot will roll with fewer cracks. In a three-high mill, unless it has been designed on this principle, the passes are lightest toward the end, and steel, which on a two-high mill could be rolled without cracks, will break and tear under this treatment. It is not proposed in these notes to enter more fully into this matter, and the suggestion in regard to rolling is made in the hope that some one may be tempted to carry out some experiments on this line, and to publish the result of his researches.

Taking the case of a mill of the usual type, rolling steel which occasionally shows cracks or defects of the kind previously described, it is believed that flaws of the character referred to as No 1 are entirely due to the treatment, or to circumstances arising during the casting of the ingot. This seems to be substantiated by the following fact: it will be noticed that these cracks seldom appear on the edges, but that they do appear on any side of the ingot, usually, however, in the lower half. In addition to being V-shaped they often appear simply as a jagged line; and it must be remembered, that ingots, which are perfect in every other respect, show this appearance.

The chemical composition of these ingots is normal, but in a number of cases it was found that the ingots showing these cracks had given trouble in stripping. Not that it was necessary to send them to the extractor, but they did not free themselves as rapidly and as easily from the molds as their companions did.

By following the ingots through, from the casting until they were rolled, it was found that these cracks very rarely (there were only two cases out of 400 examples) occurred in ingots that stripped freely. While all ingots that gave trouble in stripping did not show these defects, nor did the cracks increase in size or number with the difficulty incurred in stripping, still the natural inference seemed to be that these were shrinkage cracks, originating during the cooling of the ingot in the mold, since some part of it, being held by a rough surface, was not able to move in accordance with the shrinkage of the rest of the metal. A strain was thus set up, causing a local weakness in the skin, which tore apart under the rough work of the rolls. An examination of the surface of ingots forced out of the molds by the extractor, and allowed to cool, will strengthen this opinion.

The remedy here is simple: do not try to have too great a mold life, inspect the interior surfaces of the molds carefully and often, promptly reject all that show any flaws or roughness.

It has been the personal experience of the writer that a good mold wash, evenly and uniformly applied, has a marked effect in decreasing the number of surface defects that appear during the rolling.

Defects of the second group are believed to be caused by an excessive temperature during casting. It was at first thought that these were the result of improper work during heating—*i. e.*, burning—but a longer and more careful study of them showed that this theory must be wrong. They are persistent as to their locality, and, in addition, it was noticed that the ingots first cast (the hottest) showed this defect in the greatest degree. In many cases, the last two or three ingots cast were perfect, the first being badly marked. In addition to these two points, the fact is that many of the blows which behaved in this way were marked "very hot" on the blower's record. It is also possible that these may be another form of shrinkage faults. This form of crack has been most often noticed in ingots of the section $17\frac{1}{2} \times 19\frac{1}{2} \times 76$ inches long. These cracks are especially noticeable on account of the persistency with which they maintain their location. If the ingot be shortened the tendency is for the cracks to disappear, and in one case where ingots of this section were cast alternately 75 and 55 inches long, the longer ingots showed the cracks, the shorter rolled perfectly smooth and

flawless. The relation between the cross section and the length of the ingot should not be ignored. This relation probably varies, as does the location of the blow holes, according to the carbon content and the temperature.

Defects of the third class can be safely ascribed to careless heating. These flaws, which are of a somewhat peculiar ragged appearance, so that it is difficult to confuse them with any of the other types mentioned, can always be laid to the bad work of the heater. Their location, as a rule, furnishes the proof. They will be found, if the ingot has been heated in a horizontal furnace, on the two edges that have been exposed to the flame. If the ingot was drawn from a vertical or pit furnace, all four edges may be effected, but the distance of the marks from the bottom shows plainly that they were opposite the ports.

That defects of the fourth class all originate during the casting, and that no amount of careful heating or skillful rolling can remove them, is hardly to be disputed. The stage in the process of manufacture where this trouble originates being thus definitely located, the causes, which next must be sought, can the more easily be discovered. With one exception, these troubles arise from the carelessness or ignorance of the teemer.

This exception is the size of the nozzle not being in proper proportion to the weight of the metal and the section of the ingot. When working under this condition, the difficulties in the way of casting ingots of a sound interior and a smooth exterior are vastly increased. It must be borne in mind, that these remarks are applicable only to top cast ingots, the relative size of the nozzle having but little effect on bottom cast ingots.

In considering the proper size of the hole in the nozzle, due attention must be paid, not only to the weight of the metal, and the section of the ingot, but also to the temperature the metal and the grade of the steel. Since these conditions vary so greatly, it is impossible to lay down any rule which will apply in all cases, and the best results can be obtained only by careful experiments under local conditions.

In a general way, steel of 0.30 to 0.60 carbon is best cast through the larger nozzles, and the lower carbon steels through the smaller ones. Setting aside, however, this question of the size of hole, and considering the other causes that may give rise to troubles of this class, all mill managers know of many details during casting that, being overlooked, may cause trouble. If the molds are filled too rapidly, and this applies more particularly to soft steel, the metal may rise up along the sides and chill, forming a sort of shell. This being filled up often overflows, and, as the chilled metal has shrunk away from the mold, the overflowing steel fills this space up and forms long fingers on the outside of the ingot. A dirty nozzle will splash steel against the sides of the mold, and, unless the heat be very hot, or the pouring very rapid, these lumps of metal will not be melted off, but will remain on the outside of the ingot and cause trouble during the rolling. This same effect is sometimes produced by the too sudden opening of the nozzle. In this case the metal strikes the mold-stool and splashes up against the sides, where it chills.

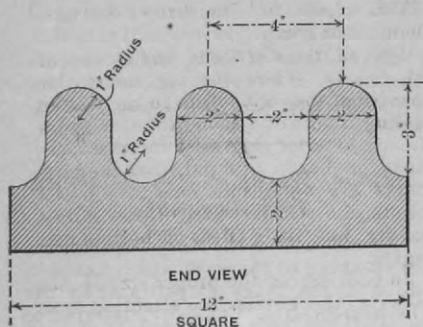
The enumeration of faults of this kind could be much extended, but as they are all due to carelessness or igno-

rance they can easily be remedied by good mill management. It is the custom in many mills, as it was in the mill where the investigation which furnished these facts was undertaken, to blame the heating, when the number of ingots that cracked under the blooming rolls increased. While the troubles that arise from careless heating must not be overlooked, still, it has been shown that but one of the four types of defects is directly due to the bad work of the heater.

Now, while it is possible that the flaws of the other three types may be made more or less appreciable by the careless or careful work of the heater, it is not believed that they can be either cured or caused in the heating furnace, and that any attempt to improve the surface must commence at the birth-place of these troubles—i. e., in the converting mill.

The Beard Furnace Tile.

Ambrose Beard, Jr., Cambridge, Ohio, has invented a fire clay furnace tile for bottoms of tin mill and sheet-heating furnaces, which, it is claimed, is superior to others now in use. The tile, which is illustrated below, is made to cover 1 square foot of surface and,



The Beard Furnace Tile.

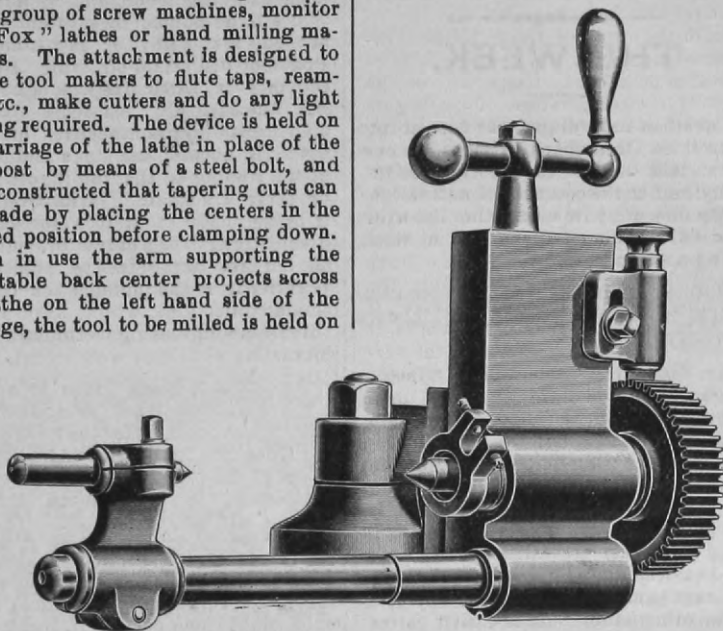
when properly laid, the furnace bottom becomes very much like the shape of a sheet of corrugated iron. The corrugations are, however, made deep, so as to allow of the radiation of heat and expansion of gases underneath the packs of sheets which are placed on the top of the corrugation. In old methods a bottom made of broken flue cinder is used, or, more commonly, coke is placed on the furnace bottom, to make the heat of packs more uniform. By use of this tile the expense of burning coke is avoided and cleaner, better results are obtained. The tiles are used for pair furnaces or heating furnaces. In furnaces for heating bars they are placed crosswise of the furnace, and for heating sheet packs they are placed lengthwise, making a clean bottom, which retains a large amount of heat and secures excellent results. The American Fire Brick & Clay Company, Mineral Point, Ohio, are the manufacturers.

The noiseless back pressure valve made by the Crane Company of Chicago was illustrated and described in *The Iron Age* of June 14, 1894. It was found, after it had been in use in various locations, that sometimes the steam pressure would cause the weight to oscillate more or less violently. This has been corrected, so that in the present construction any excessive oscillation of the weight is provided for by putting a

hub on the stem, with a brake bound around it, and by applying a slight pressure or tension to the band any undue oscillation may be regulated.

Index Milling Attachment for Lathes.

The index milling attachment illustrated in the accompanying engraving is intended to do all the milling required for a group of screw machines, monitor or "Fox" lathes or hand milling machines. The attachment is designed to enable tool makers to flute taps, reamers, &c., make cutters and do any light milling required. The device is held on the carriage of the lathe in place of the tool post by means of a steel bolt, and is so constructed that tapering cuts can be made by placing the centers in the desired position before clamping down. When in use the arm supporting the adjustable back center projects across the lathe on the left hand side of the carriage, the tool to be milled is held on



INDEX MILLING ATTACHMENT FOR LATHES.

the centers of the attachment and the cutter is revolved in the lathe, preferably on an arbor fitted to the taper hole in the spindle. Each machine is fitted with an index plate and is adapted to the use of the change gears of the lathe on which it is used. The engraving shows a gear in place of an index. The index provided has 48 teeth and will divide 2, 3, 4, 6, 8, 12, 16, 24 and 48 teeth. The attachment, with centers, will mill a tap, reamer or other tool $6\frac{1}{4}$ inches long and $2\frac{3}{4}$ inches in diameter. It is made by Ernest F. Robbins of Burrville, Conn. This device, when furnished with a drawing-in spindle, is

land Detective Agency Malone has made a confession, saying that for a consideration he had given certain iron firms more beams than their permits called for. The two firms against whom Malone is alleged to have made specific charges of collusion are those of the Swarts Iron & Metal Company and the Graff Contracting Company. The defendants claim that the charge is an attempted blackmail and that when the trial takes place facts will be brought out which will fully sustain their claim.

Lord Swansea, the Welsh copper king, known better to the trade of the



Fig. 2.—Chuck for Use with Milling Attachment.

adapted to use the Rivett chuck, the construction of which is plainly shown in Fig. 2, and which is made by the Faneuil Watch Tool Company of Boston.

Marks Swarts, president of the Swarts Iron & Metal Company, 551 to 557 State street, Seymour Swarts, secretary and treasurer of the same concern, and Barnett Graff of the Graff Contracting Company, Stock Exchange Building, Chicago, were arrested on the 4th inst., on warrants charging conspiracy to steal. The charges were brought by Capt. Henry Stern, the representative of Jesse

world as Sir Henry Hussey Vivian, is dead. It is said that during a recent visit in this country he was astounded by the wonderful work done by American copper smelters and by the Oxford Copper Company of this city in particular.

As paragraph 121 of the Tariff Act of 1894, relating to tin plate, became operative on October 1, 1894, Col. Ira Ayer, special agent of the Treasury Department in charge of the statistics of this product under the act of 1890, will prepare one more report, his last, bringing the figures of product and importa-

tions down to June 30, or the second quarter of the year. It is understood to be the purpose of the Department, as well as the intention of Colonel Ayer, to make the report for the three quarters of the year, which will be the final one of the series, in addition to covering the current statistics, a retrospect of the development of this industry under the fostering proviso of the act of 1890. This report will, therefore, be one of exceptional value and interest.

THE WEEK.

Canadian natural gas was turned into Detroit on December 1 through the new main laid under the Detroit River. Fully half the consumers of natural gas in the city are now using the Canadian product. The company are at work laying a second pipe.

Natural gas is reported to have been struck in Lincoln County, Oklahoma Territory.

At the annual meeting in Chicago, last week, of the trustees of the great drainage canal now under construction, connecting Lake Michigan with the tributaries of the Mississippi, President Winter of the board announced that the entire work will be completed by the end of 1896. The total expenditures since the inception of the work have been \$10,193,130, and the trustees have on hand \$2,466,000, cash. It is estimated that \$27,000,000 will be required for the whole enterprise. Over 6000 men are at present employed on the work.

Prairie fires last week destroyed 25,000,000 acres of grass in Western Texas and Eastern New Mexico, besides a large quantity of cattle.

Secretary Herbert has notified the Cramps of the preliminary acceptance of the new cruiser "Minneapolis." The vessel will not be finally accepted and paid for, however, until, under the terms of the contract, she has demonstrated her efficiency by five months' trial in actual naval service. She will be placed in commission at the League Island Navy Yard this week. The Cramps have been paid the speed premium of \$414,600 earned by the "Minneapolis."

Purdue University has received, as a gift from the Baldwin Locomotive Works, a pair of beautifully finished model Vaucrain compound locomotive engines.

The report of the trustees of the New York and Brooklyn Bridge for the year ending December 1 shows the receipts for the 12 months to have been \$1,199,084, of which \$1,111,816 was from the cars and \$87,268 from the carriage-way. The total receipts were \$53,823 less than last year. During the year 41,714,000 passengers were carried by the bridge cars, an average of more than 114,000 a day.

Telephonic communication has been established between Berlin and Vienna.

The adverse effect of the recent business depression as regards the embarkation of capital in new enterprises is strikingly illustrated in the annual report of the Secretary of State of Ohio, just published. It shows that the capitalization of new corporations organized in the year 1894 was only \$79,760,300, or less than one-third as much as those which began business in the previous

year, the aggregate capital of which was \$267,481,500.

The real estate market in New York City gives satisfactory indications of a revival of business confidence in this section. Real estate men generally refer to their business as healthy and to the outlook as remarkably promising. A great deal of idle money is seeking this form of investment. Over \$3,000,000 of business was effected last week in private sales alone, and it is known that a large number of substantial deals are on the point of consummation. Prices of real estate are firm. Business property is particularly sought after, but the demand embraces flats and apartment houses, vacant lots and dwelling houses, and a marked feature of the trading is the rapid reselling of property at a profit. The increase which is being made in transit facilities has given strength to uptown property, but the largest factor in the present improvement is undoubtedly the result of the late elections, which have insured three years of clean government to the city.

An effort is being made to organize a big warehouse trust to control all of the warehouses, elevators and dock facilities in Brooklyn. Although the plans of the promoters are not yet consummated, it is believed that the scheme will be carried out. The plant of the new company would, it is said, consist of 264 brick warehouses, having a floor area of 9,330,000 square feet; a water front of 14,600 feet, or 2½ miles; bulkheads of 25,913 feet; 35 covered piers of 1,160,000 square feet; 9 open piers of 17,896 square feet; storage yards with an aggregate area of 40 acres, and 16 grain elevators of a daily capacity of 1,000,000 bushels and a storage capacity of 20,000,000 bushels. The net earnings of these properties last year were about \$1,500,000, and by consolidating them, it is calculated that the amount could be increased to \$2,000,000.

The death of Ferdinand de Lesseps, the great promoter, removes one of the most picturesque and unique figures. Twenty-five years ago M. de Lesseps was at the height of his glory, when his great work, the Suez Canal, was opened to commerce. Since that time his great name and reputation have been dragged in the mire through his unfortunate connection with the disastrous Panama Canal scheme. Few more pathetic terminations to a great career have been recorded in history.

British Board of Trade returns for November show an increase of \$2,735,000 in imports and a decrease of \$2,064,000 in exports, as compared with the corresponding month of last year.

The fourteenth annual convention of the American Federation of Labor was opened at Denver, Col., on Monday, under the presidency of Samuel Gompers. The tone of the opening speeches, according to the telegraphic press reports, was of a more hopeful and moderate character than is usually looked for at the annual gatherings of the Federation. Mr. Gompers, in his presidential address, said that he believed this country was within a year of an industrial revival which, in activity and intensity, would surpass that of any previous period. With this turn in industry would come, he thought, the opportunity for the laboring man to reap the harvest for the wage workers; and he urged them to concentrate their efforts, and, by means of better organization and united effort, secure the improve-

ments so necessary for the wellbeing of the country's wage workers. In regard to the question of arbitration, Mr. Gompers remarked that disputes between the workers and employers might generally be adjusted by that method; but if they were it would only come when the workers were better organized, when their power and their rights had received greater recognition. The first step must, he said, be organization, the second conciliation; the next, possibly, arbitration; but compulsory arbitration, never.

The November foreign trade returns of the port of New York show a slight decrease in exports as compared with November of last year. As given in the *Journal of Commerce* during the eleven months since January the aggregate movement (specie excepted) amounts to \$709,269,457, against \$831,840,108 last year, a decrease of \$122,570,651. This decrease is shared in by both imports and exports, the latter being \$14,756,934 less than last year; and imports \$107,813,717. The decrease in imports is mainly due to the large falling off of free goods, which are \$218,852,163, against \$276,361,049 a year ago. The specie movements show imports \$19,705,544, against \$65,467,944 last year, and exports \$116,628,756, against \$99,768,759. Customs receipts have reached \$80,932,299, against \$109,788,303 for the corresponding 11 months in 1893.

Shipbuilders of Bath, Maine, express themselves as strongly opposed to the proposed free ship legislation in Congress.

Machine Works of the Bethlehem Iron Company.

An officer from the Navy Department, in speaking of the work which has been done for the Navy Department by the Bethlehem Iron Company, referred to the shafts of the "Raleigh" and "Cincinnati," and said that when they were delivered to the navy yard it was found necessary to put them in the lathe in order to do some special fitting on them which had not been called for in the specifications given to the Bethlehem Company. In order to do this, plugs were turned up and driven into the hollow shafting, and these latter were found to be perfectly straight, 6 inches in diameter through a 13 inch shaft, and the testing of them with calipers from end to end could detect no variation in the diameters; and when they were finally swung in the lathes on these plugs they ran as true as though they had been on their original centers. The template which was made for the thrust bearing for one of these shafts was found to fit so accurately on the thrust bearings of the other three, two being used for each ship, that on only two of the collars of the whole four could the faintest glimmer of light be seen when the template was in position. Everything was polished and given a smooth water finish, as fine as that put upon the finest and smallest of work. When the eccentrics were to be bored out, it was found that one template was insufficient for boring out all of the eccentrics for all of the engines, the shafts being so accurately turned that any eccentric could be used in any position. When we take into consideration the size of the work done and the accuracy, it certainly speaks well not only for American mechanism, but also for the care and accuracy of the work done by the Bethlehem Company.—*American Engineer.*

The Iron Age

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Railroads Speculating in Old Material.

The railroad companies that have refused to sell more than a very small part of their old material for the past three or four years, and are now hurrying to sell it, have lost a great deal of money. They have accumulated old rails, car wheels, track material and shop scrap from month to month, hoping that the tide would turn and prices would be restored to something like old figures. But for four years there has scarcely been a reaction, and values are now less than half what they were then. The time has come at last when many of these companies feel impelled to sell. Their earnings have fallen off to such an extent that they must convert assets of this character into cash. It is clearly the wrong time to sell, because it is almost impossible to expect prices to go any lower, and for some months general business has been improving. It would certainly seem the part of wisdom to hold such stocks a little longer if they have been held until bottom has been reached. But it is the history of all business transactions, especially those of a speculative nature, that great selling movements take place when prices are low, and great buying movements when prices are high. People hurry to rid themselves of what nobody wants, and scramble to buy what everybody wants. Those who are forced to sell appear to irresistibly influence those who do not really need to do so. Looking back over the past, a costly lesson seems to have been given on the subject of holding for higher prices. If the railroad companies now forcing their old material on the market had pursued their usual custom in good times of offering monthly their accumulations, and taking the best offers then obtainable, their receipts on that account would have been much larger than their books now show.

Speculation of any kind should be left to those who make it their business. If merchants or capitalists believe that they can make money by buying merchandise and holding it for a rise, they are undoubtedly influenced by their general knowledge of trade conditions, backed up by a careful study of probable developments. Nevertheless they risk their capital on an opinion which may turn out to be a mistake in judgment. The path of progress is strewn with commercial

wrecks of this character, comparatively few persons being gifted with the prescience which leads them to buy at the right time and sell at the right time infallibly. Manufacturers very generally have learned that it is exceedingly unsafe for them to speculate on their product. They sell their current output at the market price, although they may protest strongly if they are unable to realize a profit, and finally they suspend operations when profits are altogether wiped out. A former generation learned the lesson not to pile up manufactured products and hold them for a rise, and the manufacturers of the present day are heedful of the costly experience which was then gained. Perhaps railroad managers will also be wiser hereafter, in view of the cost of this experience to them. In many instances they have presented the curious spectacle of persistently beating down the price of every iron or steel product they had to buy and at the same time stoutly maintaining a high price on the old material they had on hand. The absurdity of such a position did not occur to them. They continued month after month to purchase new supplies at constantly diminishing prices, endeavored to contract ahead at still lower rates, yet refused to make corresponding concessions in the prices of what they had to sell. It is strange that they could so clearly see that new iron and steel were bound to be lower and yet fail to see that old material was fated to participate in the decline. The policy of holding stocks of old material has at times operated considerably to the disadvantage of manufacturers depending upon it. Yet this policy has not injured to the benefit of the railroad companies which have followed it. They should cease to speculate, and be content to take the going price on their monthly accumulations.

A very striking illustration of what the low cost of manufactures of iron and steel really means is furnished by a remark incidentally made by William Garrett of Joliet, the famous inventor of the rod mill which bears his name. In a lecture at Joliet he stated that "wire nails are sold so cheaply that it is estimated that if a carpenter drops a nail it is cheaper to let it lie than to consume the carpenter's time to lift and use it, and it is claimed by good authority that one keg out of five is never used but goes to waste." We have had the curiosity to do some figuring on the proposition made. Assuming that it takes a carpenter 10 seconds to pick up a nail which he has dropped, and that his time is worth 30 cents an hour, the recovery of the nail would cost 0.083 cent. There are 200 sixpenny nails in a pound, which is worth at 90 cents base and 65-cent average per keg 1.55 cents per pound. This would make the money value of the individual nail 0.0077 cent. Or in other words it would not pay to pick up ten nails, if it took ten seconds of time worth 30 cents an hour to do it in.

Warehouse Facilities in Large Cities

The necessity for retrenchment of expenses during the recent business depression caused a number of Eastern manufacturers to close up their warehouses in Western cities. They did not intend to withdraw from that field, but resolved to try the experiment of selling through agencies and making shipments direct from factories to the buyers. It has been found that this is in many lines such an unsatisfactory method of transacting business that a tendency is now being manifested to again stock warehouses in the great Western distributing cities. As usual when drastic economies are put in effect, what seemed to be a sound policy was instituted at the wrong time. The very depression in trade which made such economy desirable caused buyers to restrict their purchases to much smaller quantities than usual. But they have been obliged to order more frequently, and when they ordered it was almost invariably because the merchandise was needed at once. Long delays were inevitable if shipments were awaited from Eastern factories, hence stocks at hand were almost invariably drawn upon, and those who had warehouses were duly favored. For some time no warehouse has meant practically no trade.

Another peculiarity of this phase of business has also presented itself. Notwithstanding the cheapness of railroad transportation over teaming as a general proposition, teaming takes the lead in handling the suburban business of a large city. In Chicago, for instance, with its innumerable suburbs scattered along its 30 railroad lines for 12 or 15 miles from the heart of the city, coal and lumber are about the only classes of freight delivered by rail from city stocks to suburban buyers. Almost everything else is transported by teams. City merchants run their own delivery wagons to the suburbs or patronize local express companies making daily or tri-weekly collections and deliveries. The complexities of the railroad service, which are necessary for the transaction of their great business, are too cumbersome for rapid suburban freight service. To use a railroad line also involves hauling to a distant freight depot in the city, and hauling from the rural station to the buyer's place, necessitating probably three sets of charges. Hence time and money are saved in the use of the antiquated freight wagon as compared with the modern railroad, because the former collects the parcels at the seller's store or warehouse and delivers them perhaps the same day on the premises of the buyer. The suburban patronage thus falls very naturally into the hands of the manager of a house carrying stocks of goods, the delivery by rail from a distant factory being put to great disadvantage, especially when freight must be transferred from one railroad to another to reach a suburb on the latter line.

These inconveniences and disadvantages are only realized through experience, and the lesson has thus been taught that stocks of many classes of goods must be carried in local warehouses to capture local trade.

CORRESPONDENCE.

The Price of Wire Rods and of Nails.

To the Editor: In one of Captain Marryatt's novels a man is made to say: "There are some things poor Tom can't understand." I am a "poor Tom" when I read in *The Iron Age* that wire rods are selling in Pittsburgh at \$22.50 per ton of 2240 pounds, and that wire nails made from same (as I suppose) are quoted at 1 cent per pound. Drawing the wire from rods must cost something, making it into nails incurs another expense and the keg adds to the cost. Now, what bothers me is to get it through my head why nails should be selling for less than wire rods. Perhaps you can explain. If you can you will oblige an OLD SUBSCRIBER.

Wire nails are quoted at a base price, which is that referred to by our correspondent. It is understood, however, that every specification for nails, calling for different sizes, shall include a certain proportion of sizes on which extras are charged. This is what is referred as the "average." The general practice is to demand a 60-cent "average;" that is to say, that the extras for other than base sizes included in the order shall be an average of 60 cents per keg added to the base price. If a purchaser were to take a certain quantity of only base sizes, say at \$1 per keg, he would be charged that amount plus the average, or say \$1.60. The same general system prevails with cut nails.

OBITUARY.

ANDREW J. CAMPBELL.

Andrew J. Campbell, Congressman-elect from New York City, died at his home, 222 West Twenty-third street, New York City, on December 6, from acute Bright's disease. Mr. Campbell was of Scotch descent and was born in Newark, N. J., in 1828. At the age of 14 he began to earn his living as apprentice at the iron business in an establishment in Broome street, New York. Prospering in his trade, he became in time proprietor of the West Side Architectural Iron Works, 550 and 553 West Thirty-first street, and secretary of the Building Trades Council. He was an active Republican politician and honorably filled a number of municipal and State offices. He defeated Gen. Daniel E. Sickles in the late Congressional election in the Tenth district of New York City.

WILLIAM BURR SMITH.

William Burr Smith, one of the best known hardware salesmen in the country, died at his home in Chicago on November 28. At the time of his death he was connected with Markley, Alling & Co., 53 and 55 Lake street, Chicago. Mr. Smith was engaged in the hardware trade from his youth. He was born in Greene County, New York, February 3, 1835, and was a son of Nathan Smith, the only one of five brothers who did not remove to Chicago. Nathan settled in Michigan,

whence William removed to Chicago and in 1853 entered the hardware store of Clark & Israel D. Runyon, then doing business on Lake street. In 1855 the firm changed to Filkins, Runyon & Barker, 189 Lake street, with whom he continued. In 1856 he engaged with Cloggett, O'Bannon & Honore, 20 and 22 South Water street. In the winter of 1857-8 this stock of hardware was sold to M. N. Lord & Co., composed of Henry H. Honore and M. N. Lord, who conducted their business at 189 Lake street, and Mr. Smith went with them. M. N. Lord & Co., having purchased several stocks of hardware, and B. L. Honore, Winchester Hall and H. H. Honore having purchased other stocks, the several invoices were divided between M. N. Lord & Co. and the new firm of Honore, Hall & Co., and Mr. Smith was transferred to the latter firm in 1860, at 51 Lake street. In 1861 Honore, Hall & Co. sold out to John S. Buchanan & Co., succeeded in 1863 by Buchanan & Alling, and in 1864 by the present firm of Markley, Alling & Co., with whom Mr. Smith remained as salesman and for a portion of the time as a member of the firm through all the changes in ownership. A son was for a short time also in the employment of Markley, Alling & Co., dying at the age of 20. Mr. Smith was a lieutenant in the famous Ellsworth Zouaves at the time of their famous tour in 1860, when they won distinction for the perfection of their drill. Mr. Smith was ill but a few hours, dying of apoplectic paralysis. He married Irene A. Lord, daughter of M. N. Lord, in 1861, and had three children, all of whom are now deceased. His widow survives. Mr. Smith leaves a bright record for generosity, good fellowship, strict integrity and unflinching devotion to business.

WILLIAM E. KELLY.

William E. Kelly, proprietor of the National Iron Works and president of the National Water Tube Boiler Company of New Brunswick, N. J., died suddenly of heart disease at his home, in that city, on Tuesday, December 11. The manufacturing concerns referred to were both built up to their present importance mainly through the knowledge and business judgment of Mr. Kelly. He was in his forty-eighth year and graduated from Rutgers College in the scientific section of the class of 1868.

Trade Publications.

THE PRONOUNCED SUCCESS which has been won by the Hawley down draft furnace is strikingly demonstrated by the issue of a superb catalogue by the Hawley Down Draft Furnace Company. The general offices of this company are in rooms 805 to 807 Security Building, Chicago, and their manufacturing plant is at 194 to 198 South Clinton street. The catalogue comprises 108 pages. In it the construction of the furnace is thoroughly illustrated and described, sectional engravings being printed in colors, which show the application of this furnace to the leading types of water tube boilers, internal fired boilers, tubular boilers, &c. Very complete reports are given of tests of the Hawley furnace as compared with the common form of furnace, showing the economy effected in the use of the former. Valuable tables are printed of the cost of evaporating 1000 pounds of water with different grades of fuel as well as with oil at varying costs, also costs of the labor required with coal and with oil, also analyses of many varieties of American coals, &c. The American Society of Mechanical Engineers' code of rules for boiler tests is printed in full, together with a great deal of other useful information for steam users.

The suppression of the smoke nuisance receives consideration, as well as fuel economy. Numerous illustrations are given of plants in all parts of the country which have been equipped with the Hawley furnace, and a host of testimonials from users is arrayed to support the claims advanced.

THE SWARTS IRON & METAL COMPANY, 551 to 557 State street, Chicago, have issued an artistic calendar for 1895. Leaflets for each month are attached to a large card, on which is a very spirited picture of a football contest.

PERSONAL.

L. S. Wright, who for some years has been managing superintendent of R. D. Wood & Co., Camden Iron Works, Camden, N. J., sailed for Europe on the 12th inst. Mr. Wright goes abroad to inspect certain lines of iron and steel manufacture.

T. Travers Wood of Swansea, Wales, one of the leading tin plate brokers in the world, spent several days in Chicago last week as the guest of George G. Spencer.

W. L. Cowles, formerly chief engineer of the Youngstown Bridge Company and assistant superintendent of the North Works of the Illinois Steel Company, has accepted the position of chief engineer of the bridge department of the Pottsville Iron & Steel Company, Pottsville, Pa.

Jacob Newert announces that he has opened an engineering office at 26 West Lake street, Chicago, to design power and factory plants, make specifications and estimates and superintend the erection of works.

Arthur Morgan, formerly with the American Tin Plate Company, Elwood, Ind., and more recently superintendent of the tinning plant of the Niedringhaus Company, St. Louis, has been appointed superintendent of the tinning department of the Atlanta Steel & Tin Plate Company, Atlanta, Ind.

L. W. Jones, president and general manager of the Philadelphia Drop Forge Company, has resigned on account of ill health and has sailed for the West India Islands.

The Gordon disappearing gun carriage for a 10-inch rifle was tested for time and rapidity on December 3, at the Sandy Hook proving ground, in the presence of the Assistant Secretary of War, the Ordnance Board officials, and representatives of the builders, the Morgan Engineering Company of Alliance, Ohio. Thirty-two shots were fired within an hour, and the trial was regarded as an entire success. This carriage is slightly different in its equipment from the one tested some time ago. It is worked by electric motors, one for the air compressor and one for moving the carriage. The total weight of the carriage is 325 tons, while the gun weighs 27 tons. The contract price was \$48,000, and according to the terms ten shots were to be fired in an hour, with a bonus of \$2000 for each additional shot fired. Monday's performance, therefore, secures to the builders a bonus of \$44,000.

The next meeting of the Western Foundrymen's Association will be held on Wednesday, December 19, at the Great Northern Hotel, Chicago. The committee on test bars will present an additional report and Harris Tabor will read a paper on "Machine Molding."

An Increase in Pig Production.

While there has been comparatively little change in the number of plants operating, it is a noticeable fact that the make of individual works is steadily increasing, and this in the aggregate is telling. On December 1 the active furnace plant, grouped according to fuel used, possessed the following weekly capacity:

Fuel.	Number.	Capacity per week. Tons.
Anthracite.....	38	21,872
Coke.....	124	142,399
Charcoal.....	22	4,491
Totals, December 1.....	184	168,762
Totals, November 1.....	181	162,666
Increase.....	3	6,096

The weekly product of all the furnaces on December 1 compared as follows with that of preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
December 1, 1894.....	184	168,762
November 1.....	181	162,666
October 1.....	172	151,135
September 1.....	171	151,113
August 1.....	135	115,356
July 1.....	107	85,950
June 1.....	88	62,517
May 1.....	127	110,210
April 1.....	144	126,732
March 1.....	133	110,166
February 1.....	125	99,242
January 1.....	130	99,087
December 1, 1893.....	130	99,379
November 1.....	117	80,070
October 1.....	114	73,895
September 1.....	125	83,434
August 1.....	169	107,042
July 1.....	220	153,742
June 1.....	244	174,029
May 1.....	251	181,551
April 1.....	255	178,858
March 1.....	255	176,978
February 1.....	251	171,201
January 1.....	246	173,068
December 1, 1892.....	246	176,271
November 1.....	244	171,082

The status of the charcoal furnaces was as follows:

Charcoal Furnaces, December 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	13	3	220	10	820
New York.....	5	1	105	4	440
Pennsylvania.....	13	1	42	12	870
Maryland.....	6	0	0	6	418
Virginia.....	13	0	0	13	827
Ohio.....	9	4	241	5	426
Kentucky.....	3	0	0	3	290
Tennessee.....	9	2	320	7	171
Georgia.....	3	1	237	2	230
Alabama.....	13	3	560	10	2,735
Michigan.....	20	4	1,593	16	4,452
Missouri.....	1	1	293	0	0
Wisconsin.....	5	1	758	4	1,143
Texas.....	4	1	125	3	470
Washington.....	1	0	0	1	100
Oregon.....	1	0	0	1	200
Totals.....	119	22	4,494	97	14,192

During November, Madison, in Ohio, blew in, and Mannie, in Tennessee, started. Union, in Michigan, is out.

As compared with previous months the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
December 1, 1894.....	22	4,494
November 1.....	22	4,694
October 1.....	22	4,889
September 1.....	23	5,099
August 1.....	20	3,463
July 1.....	22	3,806

June 1.....	18	3,274
May 1.....	17	4,023
April 1.....	18	3,932
March 1.....	18	3,764
February 1.....	18	3,645
January 1.....	21	4,099
December 1, 1893.....	26	4,950
November 1.....	28	5,084
October 1.....	28	5,496
September 1.....	28	5,700
August 1.....	34	5,563
July 1.....	35	7,224
June 1.....	34	8,034
May 1.....	38	8,595
April 1.....	38	8,729
March 1.....	36	8,623
February 1.....	37	8,934
January 1.....	38	8,865

The status of the coke furnaces was as follows:

Coke Furnaces, December 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	5	2	2,714	3	3,300
Pennsylvania:					
Pittsburgh District.....	25	23	39,285	3	3,224
Spiegel.....	2	2	2,250	0	0
Shenango Val. and Juniata.....	17	14	14,932	3	1,550
Conemaugh Valley.....	14	6	6,599	9	4,129
Spiegel.....	1	1	690	0	0
Youghiogheny Valley.....	3	1	1,077	2	1,405
Miscellaneous.....	4	2	1,457	2	1,250
Maryland.....	5	0	0	5	6,000
Wheeling District.....	8	6	6,766	2	2,400
Ohio:					
Mahoning Val. Central and Northern.....	14	9	11,412	5	3,700
Hocking Val. Hanging Rock.....	10	7	6,386	3	1,938
Indiana.....	12	0	0	12	3,151
Illinois.....	13	7	2,279	6	2,091
Minnesota.....	2	0	0	2	412
Wisconsin.....	19	10	18,306	9	8,785
Missouri.....	1	0	0	1	629
Colorado.....	5	2	1,738	3	2,850
The South:	3	2	1,897	1	600
Virginia.....	22	10	6,116	12	7,385
Kentucky.....	6	2	706	4	3,118
Alabama.....	38	13	19,348	25	10,150
Tennessee.....	14	6	4,441	8	3,150
Georgia.....	2	0	0	2	969
N. Carolina.....	1	0	0	1	97
Totals.....	252	124	142,399	128	65,855

As compared with previous months the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
December 1, 1894.....	124	142,399
November 1.....	123	138,572
October 1.....	119	129,981
September 1.....	112	125,879
August 1.....	79	94,707
July 1.....	53	68,878
June 1.....	40	47,104
May 1.....	75	88,580
April 1.....	92	105,011
March 1.....	83	89,794
February 1.....	80	81,970
January 1.....	80	81,997
December 1, 1893.....	72	78,241
November 1.....	57	58,820
October 1.....	52	53,061
September 1.....	54	56,976
August 1.....	84	77,907
July 1.....	122	117,072
June 1.....	140	132,079
May 1.....	146	139,788
April 1.....	145	135,488
March 1.....	145	133,579
February 1.....	140	129,398
January 1.....	138	131,731

One of the Monongahela furnaces is out for relining, but in spite of this the current production of iron in the Pittsburgh district has increased through the heavy records made by some of the plants. Everett, on the Juniata, has started. In the Valleys and in the Wheeling, Cleveland and Chicago districts there has been no change. In Wisconsin, Mayville is running. In the South we note the blowing out of Rising Fawn for repairs.

The position of the anthracite furnaces was as follows:

Anthracite Furnaces, December 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	14	2	1,395	12	5,173
New Jersey.....	10	3	914	7	3,679
Spiegel.....	3	3	240	0	0
Pennsylvania:					
Lehigh Valley.....	39	11	5,816	28	11,010
Spiegel.....	1	0	0	1	65
Schuylkill Valley.....	27	8	4,764	19	8,211
U. S. Susquehanna Valley.....	15	2	1,455	13	4,511
L. Susquehanna Valley.....	14	3	2,800	11	4,025
Lebanon Valley.....	13	7	4,488	6	3,297
Totals.....	136	38	21,872	98	39,971

For a number of months past our records of active anthracite furnaces show the following:

	Furnaces in blast.	Capacity per week.
December 1, 1894.....	38	21,872
November 1.....	36	19,470
October 1.....	31	16,265
September 1.....	36	19,135
August 1.....	36	17,186
July 1.....	32	13,266
June 1.....	30	12,139
May 1.....	35	17,607
April 1.....	34	17,739
March 1.....	32	16,618
February 1.....	27	13,627
January 1.....	29	13,081
December 1, 1893.....	32	16,188
November 1.....	34	16,166
October 1.....	34	15,338
September 1.....	43	20,758
August 1.....	51	23,572
July 1.....	63	23,268
June 1.....	70	33,916
May 1.....	67	33,168
April 1.....	72	34,641
March 1.....	74	34,773
February 1.....	74	32,871
January 1.....	70	32,772

The only additions to plants working made during November were one Henry Clay and one Reading, in the Schuylkill Valley. Capacity has been enlarged, however, by the large output of some of the older plants as the results of remodeling.

Stocks.

The position of stocks, sold and unsold, as reported to us December 1, was as follows, the same furnaces being represented as in former months:

	Oct. 1. Tons.	Nov. 1. Tons.	Dec. 1. Tons.
Stocks.			
Anthracite pig.....	105,287	96,857	90,091
Coke pig.....	197,427	196,112	256,193
Charcoal pig.....	221,908	219,351	216,185
Totals.....	524,712	512,320	562,469

A considerable increase has taken place in the accumulations of coke pig iron, the most noticeable being in the Shenango Valley, Pa., where an increase of over 16,000 tons occurred during November. Mahoning Valley, Ohio, reports an addition of nearly 10,000 tons to last month's figures, while the returns from nearly all the other coke iron producing districts show a gradual increase.

One of the English trade papers reports that the firm of James Watt & Co. of Southwick have failed. This is the business founded by James Watt, the inventor of the steam engine, subsequently developed and carried on by Boulton and Watt.

The Tamarack Copper Mine, at Calumet, Mich., resumed work last week after an idleness of six weeks, which has probably reduced the annual product of fine copper about 1,000,000 pounds.

Galvanizing.*

BY M. P. WOOD, NEW YORK.

Galvanizing, as a protecting surface for large articles, such as enter into the construction of railway viaducts, bridges, roofs and ship work, has not reached the point of appreciation that possibly the near future may award to it. Certain fallacies existed for a long time as to the relative merits of the dry or molten and the wet or electrolytical methods of galvanizing. The latter was found to be too costly and slow, and the results obtained were erratic and not satisfactory, and soon gave place to the dry or molten bath process as in practice at the present day; but the difficulty of management in connection with large baths of molten material, the deterioration of the bath and other mechanical causes, limit the process to articles of comparatively small size and weight.

The electro-deposition of zinc has been subject to many patents, and the efforts to introduce it have been lamentable failures in both a mechanical and financial sense. Most authorities recommend a current density of 18 or 20 amperes per square foot of cathode surface and aqueous solutions of zinc sulphate, acetate or chloride, ammonia, chloride or tartrate, as being the most suitable for deposition. Herman's process has been experimented with on a commercial scale, the chief feature being the addition of the sulphates of the alkalies or alkali earth to a weak solution of zinc phosphate. Electrolytes made by adding caustic potash or soda to a suitable zinc salt have been found to be unworkable in practice, on account of the formation of an insoluble zinc oxide on the surface of the anode and the resultant increased electrical resistance; the electrolytes are also constantly getting out of order, as more metal is taken out of the solution than could possibly be dissolved from the anodes by the chemicals set free on account of this insoluble scale or furring up of the anodes, which sometimes reaches $\frac{1}{2}$ inch in thickness.

To all intents and purposes the deposits obtained from acid solutions under favorable circumstances are fairly adhesive when great care has been exercised to thoroughly scale and clean the surface to be coated, and which is found to be the principal difficulty in the application of any electro-chemical process for copper, lead or tin, as well as for zinc, and that renders even the application of paint or other brush compounds so futile unless honestly complied with. Unfortunately, these acid zinc coatings are of a transitory nature, their durability being incomparable with hot galvanizing, as the deposit is porous and retains some of the acid salts, which cause a wasting of the zinc and consequently the rusting of the iron or steel. Castings coated with acid zinc rust comparatively quickly, even when the porosity has been reduced by oxidation, aggravated no doubt by some of the corroding agents, sal ammoniac, for instance, being forced into the pores of the metal.

Other matters of serious moment in the acid electro-zincing process, aside from the slowness of the operation, were the uncertain nature, thickness and extent of the coating on articles of irregular shape, and the formation of loose,

dark colored patches on the works; the unhealthy, non-metallic look and want of brilliancy and luster prevented engineers and the trade from accepting the process or its results, except for the commoner articles of use. The Cowper-Coles process of electro-zincing articles claims to overcome all these difficulties, and plants are in process of erection with a bath of some 14,000 gallons capacity, capable of turning out 40 tons of light work per week, and in which it is proposed to treat the plates of vessels 60 feet in length upon one or both sides, and the frames of such vessels as torpedo boat destroyers and kindred craft after riveting up. These plates and frames are given a thin coating of zinc by this process that appears to be perfectly uniform in character and extent, whatever the shape of the piece may be and however numerous the lugs, flanges, mortises or core holes, and is called "zinc flashing"—that is, coating the iron or steel article, after pickling and cleaning, with a thin coat of zinc about 1 ounce per square foot of surface, which resists the inclemency of the weather and mechanical injury as well as a thicker coat, and is found to afford sufficient protection in most cases, and is adequate protection until such time as it is ready to receive the usual paint coatings.

To obviate any tendency of the paint to peel off from the zinc surfaces, as it generally manifests a disposition to do, it is recommended to coat all the zinc surfaces, previous to painting them, with the following compound: One part chloride of copper, 1 part nitrate of copper, 1 part sal ammoniac, dissolved in 61 parts water, and then add 1 part commercial hydrochloric acid. When the zinc is brushed over with this mixture it oxidizes the surface, turns black, and dries in from 12 to 24 hours, and may then be painted over without danger of peeling. Another and more quickly applied coating consists of bichloride of platinum, 1 part dissolved in 10 parts distilled water and applied either by a brush or sponge. It oxidizes at once, turns black, and resists the weak acids, rain and the elements generally.

Zinc surfaces, after a brief exposure to the air, become coated with a thin film of oxide—insoluble in water—which adheres tenaciously, forming a protective coating to the underlying zinc. So long as the zinc surface remains intact, the underlying metal is protected from corrosive action, but a mechanical or other injury to the zinc coating, that exposes the metal beneath in the presence of moisture, causes a very rapid corrosion to be inaugurated, the galvanic action being changed from the zinc positive to zinc negative, and the iron as the positive element in the circuit is corroded instead of the zinc. When galvanized iron is immersed in a corrosive liquid, the zinc is attacked in preference to the iron, provided both the exposed parts of the iron and the protected parts are immersed in the liquid. The zinc has not the same protective quality when the liquid is sprinkled over the surface and remains in isolated drops. Sea air, being charged with saline matters, is very destructive to galvanized surfaces, forming a soluble chloride by its action. As zinc is one of the metals most readily attacked by acids, ordinary galvanized iron is not suitable for positions where it is to be much exposed to an atmosphere charged with acids sent into the air by some manufactories, or to the sulphuric acid fumes found in the products of combustion of rolling mills,

iron, glass and gas works, &c., and yet we see engineers of note covering in important buildings with corrugated and other sheets of iron and using galvanized iron tie rods, angles and other construction shapes, in blind confidence of the protective power of the zinc coating; else in supreme indifference as to the future consequences and catastrophes that arise from their unexpected failure.

The comparative inertia of lead to the chemical action of many acids has led to the contention that it should form as good if not a better protection to iron than zinc, but in practice it is found to be deficient as a protective coating against corrosion. A piece of lead coated iron or terne plate placed in water will show decided evidences of corrosion in 24 hours. This is to be attributed to the porous nature of the coating, whether it is applied by the hot or wet (acid) process. The lead does not bond to the plate as well as either of the other metals, zinc, tin, copper or any alloys of them. The usual weight of lead coated terne plates is about $\frac{3}{4}$ ounce to a square foot, while hot process zinc coatings weigh from $1\frac{1}{2}$ ounces minimum to 3 ounces maximum, depending upon the temperature of the bath, and the slowness of removal therefrom giving time for the article to drain off. The following table gives the increase in weight of different articles due to hot galvanizing:

Description of article.	Weight of zinc per square foot.	Percentage of increase of weight.
Thin sheet iron = 0.026 inch No. 22 B. W. G.	1.196 ounces.	18.2
$\frac{5}{16}$ -inch plates	1.76 ounces.	2.0
4-inch cut nails	2.19 ounces.	6.72
$\frac{7}{8}$ -inch die bolt and nut.....	approximately 1.206 ounces.	1.00

Tin is often added to the hot bath for the purpose of obtaining a smoother surface and larger spangles or facets, but it is found to shorten the life of the protective coating considerably. A portion of a zinc coating applied by the hot process was found to be very brittle, breaking when attempts were made to bend it; the average thickness of the coating was 0.015 inch.

An analysis gave the following result:

Tin.....	2.20
Iron.....	3.78
Arsenic.....	Trace
Zinc (by difference).....	94.02

A small quantity of iron is dissolved from all the articles placed in the molten zinc bath, and a dross is formed amounting in many cases to 25 per cent. of the whole amount of zinc used. This zinc-iron alloy is very brittle and contains by analysis 6 per cent. of iron and is used to cast small art ornaments from. A hot galvanizing plant having a bath capacity of 10 x 4 feet by 4 feet 6 inches outside dimensions, and about 1 inch in thickness, will cost \$625 and will hold 28 long tons of zinc, which at 4 cents per pound will require \$2500 to fill it. The heating of this mass of metal and its ever changing cold immersions, with the waste by dross and extra thickness in spots, is a constant source of annoyance and expense.

The cost of an electro-chemical or wet bath Cowper-Coles plant of 6700 gallons bath, size 30 x 6 feet by 7 feet, will be but slightly more than the hot

* From a paper entitled "Rustless Coatings for Iron and Steel, Galvanizing, Electro-Chemical Painting, and other Preservative Methods," read before the American Society of Mechanical Engineers.

bath given. There is no dross formed by the use of the Cowper-Coles process, and the zinc coating formed is said to resist the corroding action of a saturated solution of copper sulphate—English Post Office test for telegraph wire—much better than hot galvanized iron wire, as per following table:

Result of Process Test Made on Samples of Charcoal Iron Wire Coated With Zinc by Various Processes

Process used to test the iron.	Grains of zinc per square foot.	Ounces per square foot.	Number of one-minute dips with showing metallic copper.
Hot galvanized.....	648.5	1.48	3
Acid bath ZnSO ₄	446.4	1.02	4
Cowper Coles process..	552.64	1.26	5

A Cowper-Coles process bath of a capacity of about 4000 gallons will treat ship plates 18 feet long, and will require an electrical energy of 2000 amperes of 5-volt electro-motive force.

With equal amounts of zinc per unit of area, the zinc coating put on by the cold process is more resistant to the corroding action of a saturated solution of copper sulphate than is the case with steel coated by the ordinary hot galvanizing process; or, to put it in another form, articles coated by the cold process should have an equally long life under the same conditions of exposure that hot galvanized articles are exposed to, and with less zinc than would be necessary in the ordinary hot process. The hardness of a zinc surface is a matter of some importance. With this object in view, aluminum has been added from a separate crucible to the molten zinc at the moment of dipping the article to be zincd, so as to form a compound surface of zinco-aluminum, and to reduce the ashes formed from the protective coverings of sal ammoniac, fat, glycerine, &c. The addition of the aluminum also reduces the thickness of the coating applied.

Cold and hot galvanized plates appear to stand abrasion equally well. The thickness of the coating being the same, tests by means of the Schlerometer show: cold galvanized sheet, 6°; hot galvanized sheet, 6°; terne plate, 2°; tin plate, 2°. The figures represent the load in grams upon a diamond point, just sufficient to cause it to scratch the specimen. The attempts to electro-zinc iron and steel wire for wire standing rigging, bridge, or other cables have not been successful; it has not been found practical to produce a wire capable of withstanding more than one immersion in a copper sulphate solution.

Both pickling and hot galvanizing reduce the strength, distort and render brittle iron and steel wires of small sections. Zinc fuses at 775° F., and the bath is usually kept at about 1000° F. Steel wire of high breaking strain has its hardness, and consequently its ultimate tensile strength and elongational efficiency, reduced by drawing of the temper and the formation of an iron zinc alloy on the surface of the wire, by as much as from 5 to 10 per cent. It is the practice when coating steel wire to keep the bath at as low heat as possible and to run the wire through it at a high rate of speed. Both these operations lead to a waste of zinc by reason of the rapid solidification of the metal on the comparatively cold wire, and consequently the ready break-

ing or cracking off of the covering metal on bending or twisting it, owing to the difficulty with which molten zinc adheres to the steel except after long contact in the bath. In some cases the wire is wiped between asbestos rubbers as it leaves the bath, but wire thus treated is found to resist corrosion but a very short time.

The English manufacturers have ceased galvanizing their high grade steel wire that cost some \$175 per ton, on account of the great risk of rendering it worthless, which is clearly a disadvantage, although the advisability of protecting the steel is unquestionable, as corrosion is found to be very marked on the inner strands of ropes or cables formed from uncoated wires. The Cowper-Coles or cold galvanizing process is in operation at the works of Laird Bros., Birkenhead, England, and used for the purpose of zincing the skin plates and frames of the torpedo boats and torpedo boat destroyers built by them for the English Navy.

MANUFACTURING.

Iron and Steel.

Ford & Donnelly, Kokomo, Ind., have just completed shipment of four additional tinning pots and four tubular boilers to the Atlanta Steel & Tin Plate Company, Atlanta, Ind.

The White River Iron & Steel Works, at Muncie, Ind., have been sold by the receiver to T. F. Rose for a consideration of \$16,200. The plant has three heating furnaces and one 8 and one 9 inch train of rolls.

The Rosena Furnace Company, at New Castle, Pa., are now using 58 per cent. Mesabi ore in their furnace mixture, with very satisfactory results. During one week 1900 gross tons were produced, and the furnace has averaged over 1800 tons per week for eight months.

Mount Vernon Furnace of the Campbell Iron Company, Campbell, Ohio, has blown in for a small blast of about 1500 tons. This furnace will probably remain idle during next season.

No. 2 Shelby Furnace, at Shelby, Ala., will go out of blast January 1.

The old Charlotte furnace at Scottdale, Pa., which was purchased in August last by the National Pipe & Foundry Works, has been leased by them to Eastern parties, who will, it is stated, make the necessary repairs and put it into blast about the first of the year.

Needed repairs are being made to the Gadsden-Alabama furnace, at Gadsden, Ala. It is said that the furnace will go into blast when the repairs are completed.

The plant of the Hollidaysburg & Gap Iron Works, at Hollidaysburg, Pa., consisting of the Gap furnace and the Juniata rolling mill, has been leased to R. C. Neall of Harrisburg. These works have been idle and in the hands of a receiver for the last four years. The new management announces that operations will be resumed at once.

Everett furnace at Everett, Pa., blew in December 1.

The Richmond Standard Spike & Iron Company, Richmond, Va., advise us that their plant at Manchester, Va., which has been idle since January 27 of the present year, was put in operation on Tuesday, the 4th inst. The plant is running double turn and is giving employment to about 100 hands.

Furnace B of the Monongahela Furnace Company, McKeesport, Pa., is undergoing repairs and relining and is expected to be ready for blast about the first of the year.

The reports that the Carnegie interest of Pittsburgh were contemplating the erection of a plant on the Huron River, between Norwalk, Ohio, and Huron, Ohio, have been officially denied.

It is officially denied that the larger part of the plant of the Pennsylvania Steel Company, at Steelton, Pa., would be closed down at the first of the year for an indefinite period. Major Luther S. Bent, of this concern, is quoted as saying that the outlook for the new year is fairly satisfactory,

and that no shut down of the plant is contemplated.

The Buckeye Iron & Coupler Company have been incorporated at Columbus, Ohio, with a capital stock of \$500,000. The new concern have obtained possession and will enlarge the plant of the Buckeye Malleable Iron Company, and will manufacture malleable iron castings and structural iron work. The incorporators are W. F. Goodspeed, T. P. Linn and others.

It is announced that the plant of the Aschman Steel Casting Company, Sharon, Pa., will be offered at sheriff's sale in a short time.

Mary Furnace, of the Ohio Iron & Steel Company, Lowellville, Ohio, is turning out an average of 250 tons of foundry iron per day. The two Cowper-Kennedy hot blast stoves recently added to this furnace permit a considerably larger output than formerly.

The report that the Warren mill, at Warren, Ohio, owned by the Union Iron & Steel Company, Youngstown, Ohio, would be put in operation on the 10th inst. is not exactly correct. It is expected, however, that this plant will resume operations in part about January 1, or shortly after that date.

All the contracts for the equipment and buildings for the new tin plate plant to be erected by the Hyde Park Iron & Steel Company, Hyde Park, Pa., on the line of the West Penn Railroad, about 35 miles from Pittsburgh, have been awarded, and the erection of the plant will be pushed as rapidly as possible. The contract for the buildings, all of which will be of iron, has been awarded to the Shiffer Bridge Company of Pittsburgh, and are now under way. The main rolling mill building will be 113 feet wide and 175 feet long. The contract for the engine was given to the Rankin-Fritzsche Engine Company of St. Louis, and it will be 13 x 60 inches in size, geared two to one, and will drive both the hot and cold mills. The contract for the rolling mill machinery has been placed with the Leeburg Foundry & Machine Company of Pittsburgh, and consists of two 24 x 44-inch finishing mills and one 24 x 44-inch roughing mill. One train will consist of a 24 x 54-inch finishing mill and the other a 24 x 52-inch balanced roughing mill. There will also be a 24 x 78-inch two-high bar mill, shears and roll lathe. The boilers will have 800 horse-power capacity, and will be of the return tubular type, the contract having been placed with the Erie City Iron Works, Erie, Pa. The new plant is expected to be ready for operation about April 1, 1895, and the product will at first consist of black plates only, although a tinning department is expected to be added after the black plate mills have been started up.

The plant of the Ontario Malleable Iron Company, at Oshawa, Ont., has been burned. The loss is placed at \$120,000, while only \$29,000 insurance was carried.

The new scale to govern wages next year at the Homestead Steel Works, Homestead, Pa., will be presented to the workmen during the annual suspension for repairs, which will probably take place next week. During this week part of the plant will work double turn and part single turn, while the 33-inch mill will be idle.

Machinery.

The Southwark Foundry & Machine Company of Philadelphia are building a blowing engine with compound steam and compound air cylinders for pumping natural gas from wells about 40 miles distant from Pittsburgh to that city.

The Novelty Iron Works, at Ashland, Wis., owned by D. J. Seyler, were burned on the 28th ult., involving a loss of \$25,000, with only \$3200 insurance. The works comprised a foundry, machine shop, boiler shop and blacksmith shop. The plant was built in 1884 and is stated to have been the first manufacturing establishment to locate at Ashland.

The Chicago Clutch & Machinery Company, whose place of business is at 76 and 78 Illinois street, Chicago, made an assignment in the County Court on the 4th inst. for the benefit of their creditors. The assignee is John Heinsen. The assets of the company are placed at \$12,500 and the liabilities at \$10,000.

Among recent shipments made by the Industrial Works of Bay City, Mich., have been a special steam crane for service in the yards of the Lukens Iron & Steel Company, Coatesville, Pa.; high capacity locomotive steam cranes to the Edgar Thom-

son Steel Works, Jones & Laughlins, Limited, and the National Tube Works Company, all of Pittsburgh and vicinity; two electric overhead traveling cranes to the Lincoln Foundry & Machine Company of Pittsburgh; an electric crane for Henry R. Worthington. The United States Government has contracted with this company for a locomotive steam crane of large capacity for the Washington Navy Yard. Orders have been received for two electric overhead traveling cranes for the Beaver Tin Plate Company, New Lisbon, Ohio, and two electric jib cranes of 30 tons capacity and one locomotive crane for the National Pipe & Foundry Company, Scottsdale, Pa.

It is officially denied that the principal machine shops of the Southern Railway system are to be removed from Manchester, Va., to Charlotte, N. C.

Lincoln & Jewett's iron foundry, at South Boston, Mass., has been damaged by fire to the extent of \$6000; partly insured.

The Kansas City Car & Foundry Company of Kansas City, Mo., have completed their plant, and start with a number of orders on their books reported to be sufficient for a three months' run.

Among recently licensed corporations in Illinois are the Marine Iron Works, Chicago. Capital stock, \$40,000; incorporators, Charles H. Towle, Bryan Y. Craig and Lucius W. Winchester.

The Jeffrey Mfg. Company of Columbus, Ohio, are working a full force of men 60 hours per week on orders. They are increasing their capacity very largely and have closed a contract with the Lodge & Davis Machine Tool Company of Cincinnati for several of their engine lathes and drill presses.

The Pittsburgh Tin Plate Works, Incorporated, New Kensington, Pa., have recently completed the erection of mills for rolling black plate, and the plant of this concern, which has been idle for some time, has been put in operation with non-union men. At this time one black plate mill is in operation, but another will probably be started during this week. As soon as a sufficient stock of black plates is secured, the tinning department of the plant will be started up.

During last week, the Leechburg Foundry & Machine Company of Pittsburgh shipped a Mesta patent pickling machine to Goldsmith & Lowenberg, at New Kensington, Pa.; one machine to Monongahela Tin Plate Company, Pittsburgh, Pa., and a third to the New Castle Steel & Tin Plate Company, New Castle, Pa. The new tin plate plant now under erection by Goldsmith & Lowenberg, at New Kensington, Pa., is well under way, the iron buildings being nearly completed and foundations are being laid for the machinery.

The machine shop of Snyder & Fisher, at Little Falls, N. Y., is to be enlarged by the building of a two story addition.

It is stated that a deal has been concluded for the removal of the Frankford Steam Forge Works from Philadelphia to Ellwood City, Pa., about 30 miles west of Pittsburgh.

John W. Blanchard, since the dissolution of the old firm of Holmes & Blanchard, of which he is the sole surviving partner, a connection of 30 years standing, announces the formation of a new company called Blanchard Machine Company, and the establishment of a machinery store and machine shop at 303 Congress street, Boston, Mass. The new company will be incorporated under Massachusetts laws and will carry on the business of manufacturing power transmission machinery, chocolate making machinery and special machines for fertilizer manufacturing.

J. J. Vandergrift of Pittsburgh has about completed the erection of a power building in that city which is located only a short distance from the freight depot of the Pennsylvania Railroad. It is stated that each floor contains 7600 square feet, capable of subdivision, and that the building is admirably equipped for the purposes intended.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., have secured a contract from the West End Street Railway of Boston for 110 motors.

Hardware.

The Penn Yan Mfg. Company, Penn Yan, N. Y., have been incorporated. The capital is \$10,000, and the directors are Melville B. Miller, Thomas S. Burns, Frank M. Fletcher, John W. Walsh and H. R. Phillips, all of Penn Yan.

The Hay & Willits Mfg. Company of Indianapolis Ind., have been incorporated, with a capital stock of \$20,000. William B. Evans, Thomas Hay, V. Burton Willits and Edwin D. Evans are the directors. The company will manufacture bicycles.

The cutlery plant of the Lamson & Good now Mfg. Company, at Shelburne Falls, Mass., was slightly damaged by fire on the 4th inst. The loss was about \$6500, with insurance of \$5000.

Sanson Cutlery Company, Wilkesbarre, Pa., report a fair fall trade, the works running regularly on full time.

The Meneely Bell Company of Troy, N. Y., have received an order for a set of chimes for Grace Church, New York City. The chimes will, we are advised, be the largest in the city, weighing in all 11,000 pounds, the largest alone weighing 3000 pounds.

Challenge Corn Planter Company, Grand Haven, Mich., had a small fire in their factory on the 1st inst., but the damage was slight and the works are running with an increased force and are turning out more goods than ever before. The company have just completed a warehouse with a capacity for 15,000 refrigerators, so that they are in a position to take excellent care of their trade in this line.

Frank Holliday of Ironton, Ohio, is reported to be negotiating for a site for a nail factory at Elwood, Indiana.

L. Hinkle of Nablesville, Ind., has made arrangements to remove his factory for the production of hardware specialties to Indianapolis, having secured a location on Market street near Missouri street.

Since the destruction of their plant by fire some time since Enterprise Foundry Company of Allegheny, Pa., have discontinued the manufacture of some of their goods, and the only articles they are now making are sash pulleys and shutter hinges.

The Beatrice Barb Wire Company of Beatrice, Neb., have made such encouraging progress in introducing their fencing to the trade that they propose to build a factory the coming year. Hitherto they have had the fencing made by other parties under contract.

Miscellaneous.

The Williamsport Wire Rope Company of Williamsport, Pa., have decided to erect a new plant, and a tract of land has been secured for that purpose. The main building will measure 268 x 80 feet, and will contain the most improved machinery for the manufacture of wire rope. There will also be an office building and a boiler and engine house, the latter 42 x 26 feet.

The Bucyrus Steam Shovel & Dredge Company of South Milwaukee, Wis., have increased their capital stock from \$150,000 to \$250,000.

The King Bridge Company of Cleveland, Ohio, will erect an iron building for the Longmead Iron Works of Conshohocken, Pa. They expect to have it finished in three weeks. The engine, boilers and rolls are in position in the new mill, which will be finished in a month. The Longmead Company expect to begin making skelp iron in the mill immediately after the first of the month.

Noble Township, in Indiana, embracing the city of Wabash, has voted to appropriate the sum of \$50,000 and the land required for the building of the shops of the Michigan Division of the Big Four Road. The company obligates itself to invest \$200,000 in buildings and improvements.

It now seems quite probable that the rate of dividends to be paid by the Philadelphia Natural Gas Company of Pittsburgh, will remain at 4 per cent. per annum. Until the company gets fuel gas into practical use, it is believed the surplus earnings will be held in the treasury instead of increasing the dividend rate.

Wilkins & Davison, of Pittsburgh, have nearly completed the erection of 100 coke ovens in Randolph county, Ill. This firm have also under erection new water works plants at Steubenville, Ohio and Grafton, W. Va., and are also erecting a number of coke ovens near the Eliza furnaces for Laughlins & Co. of Pittsburgh. At the latter place a new boiler is being erected for utilizing the waste heat in gases.

The plant of the Keystone Plow Company, Limited, New Castle, Pa., is in operation, though not quite to full capacity. This concern report considerable improvement in business over last year, and their plant will remain idle but a short time for

the usual annual repairs at the close of the year.

The Mount Vernon Car Mfg. Company, have secured a contract for 250 fruit cars for the South Carolina & Georgia Railroad. The cars are to be 60,000 pounds capacity, equipped with air brakes and automatic couplers.

The Mahoning Valley Electric Railway Company have been organized with a capital stock of \$15,000 for the purpose of putting in operation an electric railroad from Youngstown to Niles, Ohio, a distance of 10 miles.

The Champion Iron Company, Kenton, Ohio, in addition to a general line of architectural iron work, are making a specialty of iron stairways, both circular and straight, having embodied in their construction important features peculiar to the constructions put forth by this company only; the designs are handsome, combining lightness with strength, adapted to all purposes where a stairway is desired. Jail work, fencing and railing are also features of the concern's productions.

The Philadelphia & Reading Railroad Company have posted notices in their various shops that on and after Monday, December 3, employees will work only eight hours per day. In some of the shops they have been working ten hours heretofore.

The suspension has been announced of the J. W. Fowler Car Company of Elizabeth, N. J. The liabilities are said to amount to \$13,000. J. W. Wheeler of Elizabeth was appointed receiver at the request of a committee of the stockholders.

Lewis Nixon, superintending constructor of Cramp's shipyard, Philadelphia, has leased the Crescent shipyard of Samuel L. Moore & Sons' Company, at Elizabethport, N. J. The lease is for five years with the privilege of purchase. The yard is equipped for building vessels up to 400 feet in length. It was at this yard that the Schoolship "Bancroft," which exceeded her contract speed by a greater proportion than any vessel of the navy, and the light-house tender were constructed. The firm of Samuel L. Moore & Sons will continue the foundry and machine shop departments.

H. E. Collins & Co., sole agents in the United States for the Cahall vertical water tube boiler, manufactured by The Aultman & Taylor Machinery Company, report the following sales: 250 horse-power for the Salem Iron Company, Leetonia, Ohio; 250 horse-power for the Sharon Iron Company, Limited, Sharon, Pa. These boilers are to utilize blast furnace gases as fuel.

At a recent meeting of the Board of Directors of the Westinghouse Electric & Manufacturing Company of Pittsburgh, a quarterly dividend of 1½ per cent. on the preferred stock of the company was declared.

The British *United Service Gazette* gives the following forecast of the building programme for the English dockyards in the ensuing financial year: It is understood that at Chatham a new first-class battle ship of a similar type to the "Barfleur" will be laid down, together with a first-class cruiser. The latter will be something after the type of the "Edgar," but considerably larger. The "Edgar" is of 7350 tons, while the new vessel will have a displacement of 8500 tons. She will be fitted with engines of 13,000 horse-power as against the 12,000 horse-power of the "Edgar's" engines. As three first-class battle ships of the "Magnificent" class and a second class cruiser will also be in course of construction there will be ample work to maintain the staff at its present strength. Another fleet of torpedo boat destroyers will also probably be given out in the course of the year.

The Iron and Metal Trades.

The prospect of the early passage of the Patterson bill, amending the Interstate Commerce act so as to permit of pooling under certain restrictions, ought to reflect favorably upon the Iron trade. As soon as the principal customer of our industry is as able as he is willing to buy the goods he needs, the better days have come.

It is not very often that specific figures reach the public concerning railroad requirements. This makes the report of the engineer of the Atchison receivers particularly interesting. It shows that that system will require during the next five years something like 60,000 tons of Rails for renewals, annually. It is well known that a large part of the whole mileage in the country needs overhauling, and that there is an enormous quantity of rolling stock sidetracked and in round houses because the roads cannot afford to make repairs. It is the knowledge that such a state of affairs exists which keeps the embers of hope aglow.

Unfortunately there is no chance that a sufficient amount of work will be placed to stop the savage struggle for work during the next few months. Even the most sanguine defer the dawn of better days until spring.

The Steel Rail makers have suffered some disappointment, since they find buyers determined to wait until they actually need the Rails in the track before they place their orders. Possibly the mills may succeed in inducing the Pennsylvania Railroad to lead the procession of buyers, as it has done in the past.

Pittsburgh reports some activity in Bessemer Pig for delivery during the first quarter of 1895, at \$10.15 @ \$10.25.

Relatively little has been done in Steel Billets, which are held at \$15.25. There is some talk that considerable purchases for future delivery have been made in the Wire trade, the present very low prices evidently being an inducement to buyers.

There is a fair amount of structural work coming into the market from some of the leading cities, and there are some car and locomotive orders over which there is a lively scramble. Plates are exceedingly dull, and generally speaking the whole line of Rolling mill products is suffering from competition run mad.

In Foundry Iron the attitude of the local producers in the Chicago district can only be tested by time. In other sections some of the large makers show a disposition to refrain from cutting. But there is ample evidence that the smaller producers are powerful enough to set a pretty uncomfortable pace.

Tin has had a little breathing spell, and has again crossed the 14¢ line. Copper has undergone a sharp turn and rumors to account for the change are numerous. Lead and Spelter drag wearily and there is little animation in the Tin Plate market.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, December 12, 1894.

Pig Iron.—The advance made in local Coke Iron last week had a double effect. It caused the closing of a considerable number of contracts which had been pending, and checked the demand from other concerns to some extent. The early part of the week was thus somewhat active and the close of the week quite the reverse, although a few sales were then made at the advanced price. Some consumers regarded the advance as unwarranted, because other Irons are weak, but the makers defend their position on the ground that the local Iron market has been abnormally low. If the advance is maintained, however, the general opinion is that it will have a good effect in putting related lines on a substantial basis of value. The quiet condition of trade now prevailing is expected to continue for the remainder of the year, but heavy business is anticipated in January. Southern Coke Iron has been quiet, with the same conditions prevailing as before with regard to prices. A few inquiries are reported for scattered deliveries. The leading companies firmly maintain quotations, but less known brands are offered at concessions. Lake Superior Charcoal Iron has been moving in fair volume, with few sales running above 50 tons. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$13.00	@	\$14.00
Local Coke Foundry, No. 1.....	10.25	@	10.50
Local Coke Foundry, No. 2.....	9.75	@	10.00
Local Coke Foundry No. 3.....	9.50	@	9.75
Local Scotch.....	10.50	@	11.00
Ohio Strong Softeners No. 1.....	12.50	@	13.00
Southern Silvery, No. 1.....	11.50	@	11.75
Southern Silvery, No. 2.....	11.25	@	11.50
Southern Coke, No. 2.....	10.25	@	10.50
Southern Coke, No. 3.....	9.75	@	10.25
Southern, No. 1 Soft.....	10.25	@	10.50
Southern, No. 2 Soft.....	10.00	@	10.25
Alabama Car Wheel.....	17.50	@	18.00
Jackson County Silvery.....	15.50	@	16.00
Other Ohio Silvery.....	14.25	@	14.50
Coke Bessemer.....	11.00	@	11.50
Coke Malleable.....	11.00	@	11.50
Spiegeleisen 20 %.....	@	26.00

Bars.—Car orders are the hope of the Bar trade, but these are not coming out as they should. Railroads are cutting down quantities on which they were getting bids. For instance, a 1000-car order last week dwindled down to a positive contract for 100 cars when the time came for closing. The orders now in sight approximate about 2000 cars, but rumors are current that about double this business is pending. Several sales of Car Iron have been made, of which the largest was about 500 tons, but other business is light, as is usual at this season of the year. General quotations on mill shipments of Common Iron are continued at 1.05¢ @ 1.10¢, Chicago; guaranteed Iron, 1.15¢ @ 1.20¢, and Soft Steel Bars from strictly Billet stock, 1.20¢ @ 1.25¢. Jobbers report an irregular demand, being excellent from some classes of consumers, but quite light from others. They quote small lots from stock at 1.20¢ upward for Iron and 1.30¢ upward for Soft Steel.

Structural Material.—The Chicago Dock Company placed a contract for a viaduct with the American Bridge Company which will require about 500 tons. The Ringgold apartment building will shortly be let, which will absorb 600 tons of Iron and Steel. Two or three warehouses are about to be let which will require about 300 tons in the aggregate. All this is city work, in addition to which considerable outside work is now coming up, among the

contracts pending being one for a large brewery at Dubuque. This is a considerably better showing in the Structural line than has been seen for several weeks. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.45¢ @ 1.50¢; Angles, 1.35¢ @ 1.40¢; Tees, 1.65¢; Universal Plates, 1.35¢ @ 1.40¢. Small lots of Beams and Channels from stock, 1.75¢ @ 1.85¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢.

Plates.—Manufacturers' agents and jobbers talk discouragingly about the present condition of business and immediate prospects. Orders coming up are only for small quantities and on these the competition is keen. We continue prices on mill shipments, Chicago delivery, as follows: Tank Steel, 1.35¢ @ 1.40¢; Flange Steel, 1.50¢ @ 2¢; Fire Box, 2¢ @ 4.50¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.70¢ @ 1.80¢; Tank Steel, 1.50¢ @ 1.65¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, 75 % off.

Sheets.—Contracts for the future are pending on several lots of Black Sheets, but they are slow to materialize. A few sales for immediate delivery are reported. The manufacturers are a little stiffer on Galvanized Sheets and appear not so anxious to take order at prices recently ruling. Mill shipments are quoted at 2.30¢ @ 2.35¢, Chicago, for No. 27 Common Black, 2.40¢ @ 2.45¢ for Steel Sheets, and 80 % @ 80 and 2½ % off for Galvanized Sheets. Sheet Copper sells at 14¢ base to 14¢ less 10 %. Small lots are quoted at 2.40¢ @ 2.50¢ for No. 27 Common, and 75 and 10 % off for Galvanized.

Merchant Steel.—The past has been an excellent week in tonnage. Orders are considerably better than anticipated. Several large consumers have come into the market and purchased rather liberally for their future requirements. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.75¢ @ 1.80¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10½¢ and upward.

Billets and Wire Rods.—The Billet sales of the past week aggregated about 6000 tons, for delivery during the next three months, subject to the ability of the manufacturers to crowd them in. A peculiar condition of affairs is noted in this branch of trade. Not a few consumers appear to have sold their own product for delivery during a considerable part of the coming year and are now seeking to cover their requirements in Billets, but manufacturers are not willing to take chances far into the year on account of uncertainty with regard to costs. Inquiries of this kind are so good that they promise a large trade after 1895 has fairly opened. Quotations continue at \$17. The Wire Rod trade is quiet at present, since most consumers have covered their immediate wants. It is predicted, however, that there will be a shortage of Rods in January unless consumption unexpectedly declines. Quotations are unchanged at \$23.50.

Rails and Track Supplies.—Very little new business has been entered since last report for standard Rails and prices are unchanged at \$25 for this year and \$23 for 1895 delivery. Quotations are continued as follows: Steel Splice Bars, 1.30¢ @ 1.35¢; Track Bolts, with Hexagon Nuts, 1.90¢ @ 2¢; Spikes, 1.60¢ @ 1.70¢; Links and Pins, 1.60¢ @ 1.70¢.

Old Rails and Wheels.—Bids are being received on a lot of 2500 tons of Old Iron Rails and the market is nominally \$10.50 @ \$11. Old Steel Rails are quoted \$6.50 @ \$9, according to length and condition. It is not known yet whether the large block of Old Steel Street Rails has been sold. Old Car Wheels are in very abundant supply and holders are anxious to sell, but not yet willing to accept bids made. They are quoted at \$8.50 @ \$9.

Scrap.—The railroad companies have now cleaned up the Scrap very closely. Between trades for new material and sales to manufacturing consumers the stocks of Old Material in railroad yards have been reduced to practically nothing. Dealers are also carrying comparatively small stocks. The great accumulation which for a time pressed so heavily on this market has thus almost disappeared. Sales are reported during the week as low as \$8 for No. 1 Wrought, but dealers' quotations are maintained as follows, per net ton: Railroad Forge, \$8.50 @ \$9; Dealers' Forge, \$8; No. 1 Mill, \$7; Pipes and Flues, \$7; Axles, \$12.50; Heavy Cast, \$7.50 @ \$7.75; Stove Plates, \$5.50 @ \$6; Cast Borings, \$3.25 @ \$3.50; Wrought Turnings, \$5.25; Axle Turnings, \$6.25; Fish Plates, \$9 @ \$9.25; Horseshoes, \$8.25 @ \$8.50; Mixed Steel, gross ton, \$6; Heavy Melting Steel Scrap, \$6.50.

Metals.—Lake Copper is held at 9½¢ for carload lots, and casting Copper is quoted at 9½¢ upward for Eastern standard brands and best Western, but some of the smaller companies are still selling at 9¢ for carloads, spot cash. Spelter continues weak, and is now offered for future delivery at 3 15¢. Pig Lead has been freely offered at 2.90¢, with 2.85¢ @ 2 87½¢ bid.

Louisville.

LOUISVILLE, KY., December 8, 1894.

General business in this city is growing better each week, all branches taking part in improvements. In the Hardware lines the jobbers and retailers are very busy, many of the former being behind in their orders. The open dry fall has permitted outdoor work to be pushed with only one or two days intermission. True, the excessively dry weather has been hard on the farming element and others depending on natural supply of water, but certain manufacturing and contract work have been favored. Jobbers are more inclined to readily let their goods go out, knowing that the country, except in certain localities, is in a healthy condition. Good collections justify the confidence of the jobbers in the rural districts. In fact, many small inland towns are lending money freely through their city depositories. One of the principal products of Kentucky and Tennessee, leaf tobacco, will soon be poured into the markets, and this means spot cash to the country dealers. This State ranks first in the Union in production of this staple, about half of which is bought up by the principal contractors of the European Continental governments.

Pig Iron.—The market remains very quiet, although there is considerable trading in small lots for immediate shipments and for off grades. Consumers and furnace men alike seem well satisfied; both want to see advances made, and when it comes there will be some lively scrambling by the former.

However, what heavy buying there may be will be legitimate, as all elements of speculation seem to be eliminated from the Pig Iron trade, and yet, strange to say, nearly all other speculation in home products is based on the production, demand and movement of Pig Iron. Dealers and operators in this metal are satisfied with their past experience on this score. We quote:

No. 1 Foundry, Southern	
Coke.....	\$9.75 @ \$10.25
No. 2 Foundry, Southern	
Coke.....	9.00 @ 9.50
No. 3 Foundry, Southern	
Coke.....	8.50 @ 9.00
Gray Forge.....	8.25 @ 8.75
Mottled.....	8.00 @ 8.50
No. 2, Soft.....	8.75 @ 9.25
Southern Car Wheel Iron.....	15.50 @ 17.00

There is some inquiry for Old Material, both Iron Rails and Wheels. Low prices only are offered for quantities for future use. It is a strange fact that Old Wheels, which are nearly all pure Iron with little waste, should be selling for the low price of \$9 per ton, while the Car Wheel Pig Iron is worth from \$15 to \$17 per ton. In remolding Wheels the Old Wheels are certainly worth as much as the lowest grade of Pig Iron entering into the new product, and in a normal condition of the market they are worth within \$3 of the average price of Pig Metal composing the mixture. Besides this Old Wheels are worth intrinsically as much as No. 2 Foundry Iron, in most mixtures where softness is not required in a casting. A few large purchases of Wheels, which is not improbable, will make sufficient movement in them to place them in the range of prices where they belong.

In Bar Iron, Horse Shoes, Barb Wire, Wire Nails, Bolts and Nuts, there is a fair movement. Large quantities are coming down the Ohio River in barge shipments, cheapening the prices to the jobbers, who, like good philanthropists, are giving away their legitimate profits to customers. One dealer has 5000 kegs Wire Nails on a barge due here on the 10th, and already has half of them sold. This firm will reach the 40,000-keg mark for the year before the present month closes.

The Bicycle business will be pushed during the season of '95 by some of the jobbers, one firm already having ordered \$25,000 worth.

The present rise in the Ohio River will bring relief to the Coal interests along the courses of the rivers. Supplies had gotten to be very low. It is true, what detracts from the Pittsburgh and Virginia Coal interest adds to the local production, and this is in no mean proportions concerning Kentucky Coal. Vast amounts of home and foreign capital are invested in the State, and gradually the finer grades of gas and domestic Coals are finding their proper markets. There are few large cities in the East and Central States that are not benefited by Kentucky Cannel Coal enriching the qualities of their gas.

The Pennsylvania Mine Inspector's report, just published, shows that the production of bituminous coal in the ten mining districts of the State for the year aggregates about 45,000,000 tons, being a decrease of several millions from the production of the previous year.

St. John's, Newfoundland, is suffering from a severe financial crisis, which has involved the suspension of a number of banks and commercial firms in that city.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, December 12, 1894.

Dullness has been the most prominent feature in the local market for Pig Iron during the past week. There have been a few sales of 500 and 600 ton lots, but the majority of the transactions have been small. There has been no change in the general tenor of the market. It was developed through the convention of stove manufacturers, held in this city on the 4th and 5th inst., that the stove foundries have been large purchasers of Pig metal recently, some of the large transactions already noted in these columns having been with stove founders in the North and Northwest. There continues to be some urgency for the delivery of Iron already purchased to cover contracts placed, but less so than a few weeks ago, and the dearth of cars is a little less aggravating. The principal salesmen of the largest local firms have returned home with the information that buyers show no disposition to purchase Iron now except for contracts already obtained, and the prospect is that the present bill will continue until the first of the year at least and possibly longer, but encouragement is held out for renewed activity during January and February, especially the latter month, when it is expected that the car shops, malleable works and axle manufacturers will begin operations. No new contracts for cars are reported to have been made, but bids are being received for about 2000 cars, and the result will probably be known in January; and as it is estimated that each 1000 cars will consume about 6000 tons of Iron, the prospect is that there will be interesting times when the fortunate contractors are in the metal market for Pig Iron. One of the largest rolling mills in the vicinity of Cincinnati has just made a statement of its business for the month of November which is most gratifying, showing as it does that the volume of business transacted during November, with the single exception of June, 1893, was the largest for 18 months, and the month of June referred to showed the largest business for a period of 21 years. Most of the orders booked by this mill were received from manufacturers of safes and carriages, Cincinnati being the largest safe manufacturing center in the country, as well as one of the largest producers of cheap and medium class buggies and carriages. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$10.00 @ \$10.25
Southern Coke, No. 2.....	9.25 @
Southern Coke, No. 3.....	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1.....	14.50 @ 15.00
Ohio Soft Stone Coal, No. 2.....	14.00 @ 14.50
Lake Superior Coke, No. 1.....	12.00 @ 12.50
Lake Superior Coke, No. 2.....	11.00 @ 11.50
Hanging Rock Charcoal, No. 1.....	16.00 @ 16.50
Hanging Rock Charcoal, No. 2.....	15.50 @ 16.00
Tennessee Charcoal, No. 1.....	13.00 @ 13.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50
Bessemer.....	11.65 @ 12.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	15.75 @ 16.75
Lake Superior Car Wheel and Malleable.....	14.25 @ 14.75

Forge.

Gray Forge.....	8.50 @ 8.75
Mottled Coke.....	8.25 @ 8.50

On last Wednesday, the 5th inst., Matthew Addy & Co. entertained the prominent stove manufacturers of the Northwest and Southwest at dinner at the Grand Hotel. The banquet, for it was really such, was a handsome and unique affair. Geo. H. Barbour, presi-

dent of the association acted as toast-master and shared the head of the table with Mr. Addy the host. Fifty representative manufacturers were present. The speeches were brilliant, merry and witty.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, }
PITTSBURGH, December 11, 1894. }

Sales covering a considerable tonnage of Pig Iron and Billets for delivery up to April 1 of next year have been made during the week. Additional tonnage is under negotiation and indications are that considerably more material for next year delivery will change hands between now and the first of the year. Prices are low, but buyers are not having it all their own way by any means. The fact that consumers are willing to take on material for next year at present prices is regarded as the very best evidence that prices are about as low as they will go. The demand for both Raw and Finished Material for close delivery is very light and no improvement in this direction is expected until after the first of the year. A gentleman who is purchasing agent for one of the largest Steel concerns in the country stated to-day that he regarded the outlook for 1895 as very bright as far as volume of business is concerned, but did not look for much improvement in prices before the middle of the new year.

Pig Iron—Transactions in Bessemer Pig have been heavier during the week than for some time past. There have been a number of sales for delivery during the first quarter of the new year, one of those being for 5000 tons, on the basis of \$9.50 at Valley furnace, equal to \$10.15, Pittsburgh. Other lots are under negotiation, and a prospective consumer of Pig Iron is in the market for a round lot for delivery up to July 1 next. The impression is pretty general that Pig Iron has about touched bottom and any further decline in prices is next to impossible. A considerable tonnage of Bessemer Pig is expected to change hands before the first of the year. The demand for Gray Forge is only fair and prices are a shade lower. Reports are going of offers to sell Gray Forge at \$9.30, Pittsburgh, equal to \$8.65 at Valley furnace. There is no improvement in demand for Foundry Iron, and prices are weak. We quote as follows:

Neutral Gray Forge.....	\$9.40 @	\$9.50 Cash.
All-Ore Mill.....	9.50 @	9.65 "
No. 1 Foundry.....	11.00 @	11.25 "
No. 2 Foundry.....	10.80 @	10.65 "
Bessemer.....	10.25 @	"

We note a sale of 5000 tons of Bessemer at \$10.15, Pittsburgh, for delivery during the first quarter of next year. Also a sale of 2000 tons of Bessemer for December and January at \$10.25, Pittsburgh, a sale of 500 tons of Gray Forge at \$9.40, Pittsburgh, and one of 200 tons of No. 1 Foundry at \$11, Pittsburgh.

Billets.—Buyers have evidently reached the conclusion that Steel is about as low as it will go, and in their efforts to cover requirements for the first three months of the year are deluging sellers with offers to place round lots on the basis of \$15, Pittsburgh. The mills are holding out for \$15.25 and which side will give way remains to be seen. Makers assert that a very great risk is assumed in selling very far ahead at present prices. It is considered that only the best equipped mills can come out whole at \$15.25 and the claim is undoubtedly true.

Should only a slight advance in Bessemer Pig take place early next year, those mills who are compelled to buy a portion of their Pig Iron could not put it into Steel and realize a profit at present prices. A local mill that has heretofore held aloof and refused to meet the market has lately reappeared as a seller, and it is credited with disposing of several round blocks, one for delivery up to July 1 of next year. We quote the Steel market at \$15.25 at maker's mill, and note a sale of 3000 tons at that price, for December and January delivery.

Ferromanganese.—We quote domestic at \$48.50, delivered at buyer's mill. It is probable that the foreign article can be laid down in Pittsburgh at a shade under this price.

Steel Rails.—The local mill is fully employed on Rails, and the output for the month of November is reported to be the largest for any month in the history of the plant. The association price of \$22, Pittsburgh, for Rails 45 lb and upward prevails.

Plates.—A slightly better inquiry is noted, but no large contracts have been placed in this market for several weeks. Mills whose order books are comfortably filled are somewhat firm in their views as regards prices. We quote as follows: Tank Steel, 1.15¢ @ 1.20¢, according to order; Flange, 1.35¢ @ 1.40¢; Shell, 1.30¢ @ 1.35¢.

Structural Material.—The volume of business is slightly improved, a large tonnage for Eastern delivery having been secured by a local mill, and as a consequence prices are a shade firmer. Pittsburgh also took an order last week for the Beams and Angles for a lake boat, while the Plates went to Cleveland. We quote Beams and Channels up to 15-inch, at 1.25¢ @ 1.30¢; Angles and Universal Plates, 1.10¢ @ 1.20¢; Tees, 1.35¢ @ 1.45¢.

Muck Bars.—The demand is very light. Outside brands of Muck Bars are being offered in this market at \$18, delivered at buyer's mill. For standard grades \$18.50 @ \$18.75 is asked.

Merchant Steel.—While business is somewhat better than it was at this time last year, it is still very much short of being satisfactory. Prices show no material change, and we repeat quotations of last week, as follows: Bessemer Machinery, 1.15¢ @ 1.25¢; Open Hearth Spring, 1.50¢ @ 1.60¢; Open Hearth Machinery, 1.40¢ @ 1.50¢; Machine Straightened Tire, 1.40¢ @ 1.50¢; Sleigh Shoe, 1.50¢ @ 1.60¢; Toe Calk, 1.70¢ @ 1.75¢. These prices are occasionally shaded for desirable orders.

Bars.—While a slightly improved demand is reported, there is as yet a great deal of unemployed capacity, and so long as this remains idle little or no improvement in prices can reasonably be expected. In the Valley the mills are doing a fair share of work, but none of them have sufficient orders to allow them to run to full capacity. A material improvement in demand is expected shortly after the first of the year, say about February 1, when railroads are expected to commence to place their orders. Desirable orders coming into the market are still taken at prices which certainly leave little or no margin of profit. We quote Common Iron Bars at 0.90¢ @ 0.95¢, and Soft Steel Bars at 1¢ @ 1.05¢ for usual averages.

Sheets.—The demand for both Black and Galvanized Sheets is somewhat quiet, but some inquiries are in the market for round lots for delivery next year. Although mills are more or less

anxious for business, prices have shown no material decline but are weaker. We continue to quote No. 27 Common Iron at 2.15¢ @ 2.20¢, and No. 27 Steel at 2.25¢ @ 2.30¢ for round lots. It is not improbable that our lower quotations might be slightly shaded for round lots. Galvanized Sheets are in fair demand, and are ruling at 80 % off. For an order embracing a round lot this price might also be slightly shaded.

Skelp Iron and Steel.—Reports are going of a sale of 5000 tons of Grooved Iron Skelp to a local consumer at an extremely low price, and for delivery up to July 1 of next year. We quote as follows: Grooved Steel Skelp, 1¢ @ 1.05¢, according to width and order; Sheared Steel Skelp, 1.10¢ @ 1.15¢; Grooved Iron Skelp, 1.15¢ @ 1.20¢; Sheared Iron Skelp, 1.25¢ @ 1.30¢.

Pipes and Tubes.—Nothing of interest developed during the week. The demand is only fair and prices are low, depending largely on nature of the order.

Wire Rods.—Some sales of Wire Rods embracing a fair tonnage have been made during the last week and for delivery covering the first quarter of the year. For small orders \$22, Pittsburgh, is asked, but for round lots this price would be shaded.

Wire Nails.—The situation in the Wire and Cut Nail trade shows little or no change. Up to this time the demand has been very fair, but is now falling off, as it usually does at this season of the year. A fair amount of business has been placed for delivery next year, but there is still some of the larger buyers who have not yet covered their requirements in the expectation of securing lower prices. The mills are somewhat anxious for business, and as a result the low prices noted as ruling for some time past still prevail. We quote Wire Nails for December delivery at 90¢ and for round lots, with desirable specification, it might be possible to slightly shade this price. Cut Nails are in only fair demand and no improvement in this direction is expected until after the first of the year. We quote Cut Nails at 80¢ in carload lots for usual averages.

Barb Wire.—The demand for Barb Wire for close delivery is light, but considerable business has been placed for delivery next year and there are inquiries still in the market covering a large tonnage. The mills are understood to be pretty comfortably fixed, and there is a general expectation that a very large trade will be done during the coming year. Prices show no material change, and we continue to quote Four-Point Galvanized at \$1.90, in carload lots for close delivery. For delivery up to March of next year makers are asking a considerable advance over this price. Plain Wire is ruling at \$1.20 @ \$1.25 in carload lots.

Connellsville Coke.—For the week ending Saturday, December 1, there were 14,280 ovens in the Connellsville region active, and 3294 idle, the total estimated production for the week in question being 142,774 tons. Compared with the production of the previous week, this was an increase of 1765 tons and an increase in active ovens of 365. Some contracts for Coke for delivery during the first quarter of the year are under negotiation, and will probably be closed during this week. Coke makers do not seem anxious to take contracts for delivery up to July 1 on the basis of \$1 7/8 ton, but are willing to sell for the

first quarter of the year at that price. The feeling still prevails among Coke operators that it is short sighted policy to sell Coke at present prices, but as yet no plan has been devised whereby higher prices can be obtained.

Iron and Steel Scrap.—As noted last week, consumers of Iron and Steel Scrap are not buying anything that they can possibly avoid, and as a result very little is doing in this branch of trade. Prices on many kinds of Scrap depend altogether on the conditions under which the order is placed. The following quotations represent asking prices: No. 1 R. R. Wrought Scrap, \$9.75 @ \$10, net ton; Railroad Cast Scrap, \$9, gross ton; Hammered Iron Car Axles, \$18 @ \$18.50, net ton; Rolled Iron Car Axles, \$15.50, net ton; Car Wheels, \$9 @ \$10, gross ton, according to quality; Old Iron Rails, \$12, gross ton; Old Steel Rails, 6 feet and over, \$11, gross ton; short or mixed lengths for melting stock are very dull, and are freely offered at \$9, gross ton; Cast Iron Borings, \$5, gross ton; Steel Leaf Springs, \$11.50, gross ton, and Steel Coil Springs \$10.50, gross ton.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., December 11, 1894.

There is so little business doing, and so little change in prices, that it seems almost useless to make a new report of the market. The volume of business is gradually assuming holiday proportions, and, with that, something akin to holiday prices, but no matter how low prices may be, buyers are callous and indifferent. Compared with this time a year ago there is of course considerably more doing, but there are more plants in operation and greater competition to secure business, so that it is questionable if some manufacturers are any better off than when they were doing nothing. More men are employed, however, and to that extent the situation has improved, and, besides, the prospect is better for the coming year, so that, unsatisfactory as things are, they have been worse, and have also had less promise of an early improvement. The next four or five weeks will no doubt be very trying, but after that the trade hope and believe that better times will be met with, and that some time during the spring work will be more abundant and prices more remunerative.

Pig Iron.—Business is very light, and although prices are almost as low as they have been at any time on record, buyers seem unwilling to negotiate for any but moderate sized lots, and even then prices have to be made to suit. Sellers are anxious for business, but as it requires two to make a bargain, there is no alternative but to wait until buyers are ready to put in their bids. Of course there is no room for much of a decline, and it is by no means certain that there will be any, but in the meanwhile business cannot be done except in a very small way, unless prices are shaded from those realized during the past three or four weeks. Deliveries are still somewhat delayed, from which it may be supposed that furnaces will not be hampered very much, even if there is a falling off in demand, which in any event cannot continue for any length of time. There is renewed weakness in Bessemer Iron, however, which can be now delivered at \$12.25 @ \$12.50, although there is very little demand for that class of material.

General quotations are about as follows for Philadelphia and vicinity, with the usual 20¢ @ 30¢ less at points within a radius of 100 miles South or West:

Bessemer.....	\$12.25 @ \$12.50
Standard No. 1 Foundry X...	12.50 @ 13.00
Standard No. 2 Foundry X...	11.50 @ 11.75
No. 2 Plain.....	10.75 @ 11.00
No. 1 Soft.....	11.50 @ 11.75
No. 2 Soft.....	10.75 @ 11.00
Standard Gray Forge.....	10.50 @ 10.75
Ordinary.....	@ 10.25

Steel Billets.—The market is extremely dull, and orders to deliver at about \$17.50 receive but scant attention from large buyers. Small lots command \$17.75 @ \$18, but the tonnage is light, and from present appearances prices will have to be lower or consumptive requirements larger before there is any general renewal of the demand.

Finished Material.—The general report of the market is that business is dull and prices pretty well down to the lowest on record. In some lines, such as Structural and Bridge work, mills are doing a fair amount of business and have very good prospects for its continuance, but Plates, Sheets, Bars and Skelp are duller than they have been for some time, and prices would certainly be lower if bids could be had for good sized lots, failing which the old figures are quoted and realized as nearly as may be, but it is fully recognized that they are more or less nominal. Delivered, prices are about as follows for small lots:

Grooved Skelp.....	1.15¢ @ 1.20¢
Standard Refined Bars.....	1.15¢ @ 1.25¢
Medium quality.....	1.05¢ @ 1.10¢
Tank Steel.....	1.25¢ @ 1.30¢
Heavy Plates.....	1.25¢ @ 1.30¢
Shell.....	1.50¢ @ 1.60¢
Flange.....	1.60¢ @ 1.80¢
Angles.....	1.40¢ @ 1.50¢
Beams and Channels.....	1.50¢ @ 1.60¢

Old Material.—Mills are preparing to shut down preparatory to stock taking, so that there is not much new business doing, although prices are firm. Stocks are greatly reduced, so that there is no pressure to sell unless at quoted rates, which are about as follows:

Heavy Melting Steel.....	\$10.00 @ \$11.00
Light Melting Steel.....	8.00 @ 8.50
No. 1 Wrought Scrap.....	11.00 @ 11.50
Machinery Cast.....	9.00 @ 10.00
Wrought Turnings.....	8.00 @ 8.50
Cast Borings.....	6.25 @ 6.75
Old Iron Rails.....	12.00 @ 12.50
Old Car Wheels.....	10.00 @ 10.25
Old Iron Axles.....	15.50 @ 16.50

Pilling & Crane are making contracts for Hammer and Roll Scale for delivery in large quantities during 1895, and would be glad to hear from parties interested in the article.

Birmingham.

BIRMINGHAM, ALA., December 10, 1894.

This week shows little change from the last in the general situation, though there is none of that nervousness noticeable which prevailed among the Iron men here in the last month. Even some who have been disposed to take a very gloomy view of the situation in the past two or three months are taking a little more hopefully of the coming year. The general consensus of opinions is decidedly that no prominent changes need be looked for in the first half of next year; that the tendency will be to a larger consumption and a gradual improvement in prices, but in no case is hope expressed of seeing a very material rise in the early part of 1895. The

condition of the Steel Rail market interests the Iron men especially on account of the fact that some of our strongest and most determined competitors on low prices are the Bessemer furnaces, which are forcing the Foundry market on account of lack of Bessemer orders. As soon as they revert back to their natural channels we will see an improvement in the Foundry markets. For this reason developments in the Steel Rail market and among the railroads are watched with close interest.

Pig Iron.—The market shows a better feeling all around, without, however any material improvement being perceptible. Sales are very fair in most quarters, well up to make, though mainly in small lots from carloads to 500 tons. However, several good sized sales are reported, and especially among the higher grades. None, however, exceed 1000 tons. Demand for grades is well distributed, the higher grades calling for prompt shipment in most cases. With Gray Forge at \$6, and even less, this is a very agreeable and consoling feature of the market. There is little demand for shipments or sales beyond six months, and comparatively few sales are recorded for even that period, as furnacemen do not feel warranted to sell far into next year. Prices are as before, and have shown little tendency to weaken except in Gray Forge, which is reported to be shaded below \$6 in some cases. A curious feature is the accumulation of stocks in spite of heavy orders and pressure for prompt shipment. Makes have become so large in some instances compared to former outputs that facilities for handling the increased yield have not kept pace with it, and this, coupled with scarcity of cars, has caused an accumulation of stocks not warranted by the appearance of order books. Quotations range as follows: No. 1 Foundry, \$8; No. 1 Soft and No. 2 Foundry, \$7; No. 3 Foundry, \$6.50 @ \$6.75; Gray Forge, \$6.

Finished Material.—The market is weak and unsatisfactory. There is absolutely no improvement in prices, and the tendency is to stock rather than sell ahead. Some demand is experienced for sales well into next year, but at figures that have caused the rejection of the inquiries. Stocks are accumulating some. There is no probability of any resumption of other mills. The railroads have shown no tendency to buy, and hence no special activity is noticeable in this direction.

Rails and Track Material.—The strong movement in the lumber regions is beginning to bear some fruit. A deal has been closed in Mobile by New Jersey people for a large tract of timber lands, some 4000 acres, and a complete outfit to develop same. Eight miles of Rails, two locomotives and necessary rolling stock have been bought, and preparations are in progress to put up a large mill of 100,000 feet daily capacity. Altogether some \$100,000 are reported as being involved in this deal.

A recent census bulletin published in Washington shows that in 1890 the number of persons of foreign parentage in the United States was 20,676,046, or 33 per cent. of the total population of 62,622,250

A late dispatch from Hobart Town, Tasmania, reports the discovery of a diamond field at Corrinna in that island.

St. Louis.

(By Telegraph.)

Office of The Iron Age,
Bank of Commerce Building,
St. Louis, December 12, 1894.

Pig Iron.—As is usual at this period of the year, consumers are allowing their stocks to run down and are holding off shipments until after the turn of the year. Prices continue very low and No. 2 Foundry, which is the favorite grade among foundries, is quoted at \$9.75, f.o.b. cars St. Louis. There is some talk of No. 2 Foundry having been sold at \$9.50, but investigation has proved this to be incorrect. Furnacemen are looking for a revival of business early in the new year, and the general indications point to an increased consumption very shortly. It is doubtful if prices can go any lower and it is pretty generally agreed that a few sales of good round lots would go far toward advancing the present low quotations. Sales during the week have been extremely quiet. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	\$10.50 @ \$0.75
Southern Coke, No. 2 Foundry	9.75 @ 10.00
Southern Coke, No. 3 Foundry	9.25 @ 9.50
Southern Car Wheel	16.50 @ 17.00
Gray Forge	9.00 @ 9.25
Ohio Softeners	14.00 @ 14.50

Bar Iron.—The demand is only fair and prices do not show any improvement. Jobbers report a limited trade and state it runs largely to small lots. At 1.05¢ the market is anchored and it is difficult to shade this figure. Jobbers quote 1.10¢ @ 1.15¢, according to quantity.

Barb Wire.—There is no change to note in the Barb Wire market. There is very little inquiry from large buyers and prices are if anything weaker than last reported. Painted is quoted \$1.65; Galvanized, \$2.05.

Wire Nails.—Some extremely low prices are quoted for Wire Nails, but the general market quotation remains at \$1.10 @ \$1.15 for lots from jobbers. The season is against heavy buying, and while some orders have been booked for spring delivery they are not particularly numerous.

Rails and Track Supplies.—The demand for Steel Rails for this year's delivery is practically dead. The reduction in price which takes effect January 1 will naturally carry considerable business over into next year. We quote \$24.50 for next year's delivery. Track Supplies are unchanged, as follows: Splice Bars, 1.20¢ @ 1.25¢; Spikes, 1.60¢ @ 1.65¢; Bolts, Square Nuts, 1.75¢; with Hexagon Nuts, 1.85¢; Steel Links and Pins, 1.50¢; Iron, 1.60¢; Old Iron Rails are nominally \$10.

Pig Lead.—There has been some effort made to sell for next year's delivery, but consumers have seemingly no faith in the market and are apparently willing to take their chances. The consumptive demand is limited and the speculative demand is practically dead. Sellers ask 2.90¢, which figure is higher than consumers are willing to pay. A dull market is the natural result at the close.

Spelter.—Occasional carloads are reported as having been sold, but, generally speaking, the market is extremely dull. Prices are unchanged. We quote 3.10¢ @ 3.15¢.

Metal Market.

Pig Tin.—There has been considerable reaction in prices and the market shows better tone, superficially at least. Whether there is a change in the programme of leading operators or that a natural reaction from persistent heavy "short" selling has taken place is not clear, but bearish sentiment has abated somewhat. From the lowest point touched last week prices have advanced about 0.70¢ per lb, or to 14.20¢ for prompt and near future deliveries. In the movement there was something more than feeble indication that the bear party has covered short sales to a considerable extent and current report had it that numerous settlements were made quietly. Trade and consumptive buying has meanwhile gone on in about the usual way and there is nothing to show that any really important change in the statistical position here has taken place during the week under review. There is, however, less talk about prospects for buying "8 lb of Tin for \$1." At the close of the week early deliveries were offered at 14.25¢ and late shipments at 14.10¢ @ 14.15¢, net cash.

Copper.—Lake Superior Ingot offered during the week at under 9.65¢ has been about all cleaned up, either purchased or withdrawn from the market. There are few sellers now, if any, at less than 9.75¢, and leading producers ask a considerable advance over that rate. Electrolytic has also been marked up, and good brands at less than 9.50¢ are very difficult to find. Common casting stock at less than 9.25¢ seems to be out of reach at the moment. Sales agents do not confirm reports of a producers' agreement, neither do they report unusually heavy business. In fact, the sudden and sharp turn in the market is somewhat mysterious, but rather suggestive of manipulation to clinch orders for next year's delivery at good rates. It is suggestive also that speculation in futures in the London market has been unusually lively during the week. The periodical December rumors of large sales for 1895 delivery have circulation, as have also the rumors of reduction in output.

Pig Lead.—No change of importance has taken place during the past week. As far as reported, the buying has been commonplace and merely fair in the aggregate amount, while a small fraction will measure the fluctuation in prices. Below 2.12½¢ and above 3.15¢ for round lots have been strictly exceptional rates for either domestic or foreign, but buyers at over 3.10¢ are very few at the present time.

Spelter.—Transactions in this quarter have been on a very moderate scale. Offers of some Western brands were made at 3.30¢ and others that enjoy better reputation were quoted outright at 3.35¢. Low as they were the prices failed to enliven buying interest and sales of more than single carload lots have been the exception.

Antimony.—Aside from ordinary jobbing business little has been done. Prices remain quite steady at 7½¢ for Hallett's and 8½¢ for Cookson's, on the spot.

Nickel.—Prices remain at about 35¢ @ 40¢, as to quantity and delivery.

Tin Plate.—The market has gained little if anything in spirit; certainly nothing in tone. No class of buyers seem to have sufficient confidence to purchase except as imperative wants dictate despite the lowness of prices.

Sellers seem to be rather more reserved in their offering, but concessions from the prices publicly quoted are occasionally made, and the market still has a rather weak appearance. On spot stock the quotations are as follows: Charcoal Tins: Melyn Grade, one-half X IC, \$4.75; IX, \$6.25; Lisvane, &c., IC, \$4.30; IX, \$5.12½; Alaway Grade, IC, \$4.20; IX, \$5; Siemens Steel, IC squares, &c., full weight, \$4.30 basis; 100 lb, \$4.00 basis. Bessemer Steel, IC squares, &c., full weight, \$4.25 basis; 100 lb, \$3.95 basis. Coke Tins, IC, 14 x 20: Bessemer Steel, full weight, \$4.00; 100 lb, \$3.65; 95 lb, \$3.57½; 90 lb, \$3.50. Charcoal Tines: M. F., IC 14 x 20, \$6; IC 20 x 28, \$12; Worcester, IC 14 x 20, \$4.50; IC 20 x 28, \$3.60; Alyn, full weight, IC 14 x 20, \$4; IC 20 x 28, \$8; Alyn, 100 lb, IC 14 x 20, \$3.85; IC 20 x 28, \$7.60; Dean, full weight, IC 14 x 20, \$4.05; IC 20 x 28, \$8.10; 100 lb, IC 14 x 20, \$3.90; IC 20 x 28, \$7.80; D. R. D. Grade, full weight, IC 14 x 20, \$3.90; IC 20 x 28, \$7.85; 100 lb, IC 14 x 20, \$3.80.

New York.

Office of The Iron Age, 95-102 Reade street,
New York, December 12, 1894.

Pig Iron.—The market is quiet and sales are limited. A sale of a round lot of Southern Iron for delivery at Sing Sing has led to some erroneous inferences as to the equivalent price at furnace. It is higher than is figured, because special freight arrangements were made. We quote \$12 @ \$12.50 for No. 1; \$11 @ \$12 for No. 2, and \$10.50 @ \$11 for No. 2 Plain, standard brands, tidewater delivery. Southern Iron, same delivery, is selling at \$11.25 @ \$11.50 for No. 1; \$10.25 @ \$11 for No. 2; \$10 @ \$10.50 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$10.75 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.50 @ \$10.

Cast Iron Pipe.—The Washington order has been reduced to about 1000 tons, and bids have been postponed till next Monday. The Japanese Pipe contract is getting into better shape.

Ferromanganese and Spiegeleisen. The market for Spiegeleisen is practically dead. In Ferromanganese the principal Pittsburgh producer has entered upon a campaign of retaliation upon the importers who have been invading the territory west of the Alleghany Mountains, by offering down domestic Ferromanganese in the Eastern markets. We quote nominally, for foreign, \$47 @ \$48 for 80 % Ferromanganese and \$20 @ \$20.50 for 20 % Spiegeleisen, tidewater.

Billets and Rods.—This market is dull at nominally \$17.50 @ \$18 for domestic Billets and \$24.25 @ \$24.50 for Wire Rods, tidewater.

Steel Rails.—The attitude of the railroads has become more clearly defined and is unmistakably one of indifference, so far as placing winter work is concerned. It looks as though there will be little business until well toward spring. Rail makers receive with indifference the reports that the Cleveland Mill is getting ready to roll Rails, simply because there is no business to capture for anybody. If the report proves true, it would be merely a repetition of a move which proved pretty remunerative a few years since. We note the sale of a lot of about 1000 tons for a street road at New Britain, Conn. We continue to quote \$22.75, tidewater, for standard Rails and \$24 for Girder Rails.

Track Material.—We quote as follows: Spikes, 1.40¢ @ 1.60¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 1.80¢ @ 1.90¢, and Hexagon Nuts, 1.90¢ @ 2¢, delivered.

Manufactured Iron and Steel.—An Eastern mill has captured the order for 3000 tons of material for the power house, a large part of it being riveted work. The mills are very anxious for winter work, and are competing sharply. The demand for Plates is very light, and close prices are being made. Some very low figures were named on a small lot for shipment to California. It is reported that the Newport News yard has taken an order for a steamer. Low prices have been made on Bars, but under somewhat exceptional circumstances. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢ for round lots; Angles, 1.20¢ @ 1.35¢; Universal Mill Plates, 1.20¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.35¢ @ 1.50¢, on dock; Steel Plates are 1.25¢ @ 1.40¢ for Tank; 1.40¢ @ 1.45¢ for Shell; 1.50¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.10¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.10¢; Soft Steel Bars are 1.10¢ @ 1.30¢; Scrap Axles are quotable at 1.25¢ @ 1.50¢, delivered; Steel Axles, 1.25¢ @ 1.50¢, and Links and Pins, 1.35¢ @ 1.50¢; Steel Hoops, 1.40¢ @ 1.50¢; Best Iron Boiler Rivets, 2.90¢ @ 3¢, delivered; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.60¢ @ 1.70¢, and Sleigh Shoe, 1.20¢ @ 1.25¢; Tire, 1.30¢ @ 1.35¢, and Spring, 1.65¢ @ 1.70¢, delivered.

Old Material.—The market is exceedingly dull. It is understood that a leading New England road has withdrawn a lot of 2000 tons of Old Iron and 2000 tons of Old Steel Rails. On the other hand, efforts are being made to sell a lot of 1500 tons of Old Iron Rails afloat from a distant colony. There have been heavy offerings of Old Car Wheels. One lot of 1500 tons and one lot of 500 tons are seeking buyers at \$8.50. We note the arrival of a cargo of 1000 tons of Old American Car Wheels from Mexico.

Financial.

No important changes have developed during the week in the financial world, save the export of \$1,250,000 gold on Saturday, following the sale of some 50,000 railroad stocks by European holders, and a rise in sterling exchange on Monday to the highest rates of the year. It was generally expected that further gold shipments would be made by the Wednesday steamers this week, but none of the precious metal was so engaged after all. Heavy exports are, however, looked for by Saturday's outgoing vessels, which will probably cause a large drain on the Treasury. This movement is not encouraging so soon after the sale of the new bond issue. The total exports of gold so far this year have amounted to \$88,000,000, against which \$21,400,000 has been imported in the same period, leaving a balance of \$66,600,000 net exports to date, against one of \$9,000,000 at the same period of last year.

Some further important selling of American securities by foreign houses this week has given added strength to the foreign exchanges. Sales of sight sterling bills were made on Tuesday

as high as \$4.88½ and \$4.89, less a commission, while the supply of bills was limited and the demand from remitters unusually urgent. Bankers estimate that from \$2,000,000 to \$3,000,000 must inevitably go out on Saturday. The new Russian loan is said to be exerting an influence on the movement of the yellow metal. London is reported to be sending large amounts to Paris for this purpose, and it was to that center that last Saturday's New York shipments were consigned.

Withdrawals of gold from the Treasury during the week, for export and other purposes, have already brought the \$110,000,000 reserve of metal down to \$106,800,000, and any active outflow movement would soon reduce the balance again to the \$100,000,000 mark. Meanwhile, although the general Treasury receipts have shown an improvement since the first of the month, the proportion of gold paid for customs and internal revenue continues comparatively insignificant, and does little to aid the balance. Treasury officials do not, however, feel apprehensive of any material reduction in the existing gold balance at present, and look for some legislation during the next six months which will avert any further dangerous shrinkage. Secretary Carlisle, in his annual report, makes this matter a special feature, and indicates a plan of financial reform designed to put an end to the necessity of frequent bond issues in order to bolster up the Government gold reserve.

This report has attracted much attention in banking circles, and the details have elicited many adverse comments, especially the proposals for a 30% deposit of legal tenders against notes, and the general abandonment of compulsory reserves against deposits, both of which are regarded as open to serious objections. It is not expected, however, that any currency legislation will be consummated by the present Congress. The question is so important and the proposed changes so radical that exhaustive inquiry and deliberation would be needed before final action can be taken by the Legislature.

Saturday's weekly statement of the New York banks reflected the effects of recent withdrawals of gold for Government bond purchasing purposes, in a decrease in legal tenders of \$5,406,900 and in specie of \$17,357,600, the total decrease of reserve being \$22,764,500. Last week the statement showed a total decrease in reserve of \$16,940,700, and these two statements exhibit the condition of the banks of this city at the close of the bond transaction. Deducting receipts of gold from interior points and other sources, it seems that the New York Associated Banks have lost about \$35,000,000 gold. The decrease in net deposits during the two weeks has been nearly \$25,000,000, and the increase in loans \$12,600,000. The deposit decrease reflects about the amount of bonds taken by trust companies and individuals. Altogether about \$50,000,000 for bonds went to the Government from this city. The surplus reserve above legal requirements now stands at \$32,902,650, against \$76,565,000 a year ago.

The important changes in the principal items of the New York bank statement for the week were as follows:

Surplus reserve.....	Dec.	\$19,318,150
Loans.....	Inc.	8,273,400
Specie.....	Dec.	17,357,600
Legal tenders.....	Dec.	5,406,900
Deposits.....	Dec.	13,785,400
Circulation.....	Inc.	21,100

This week's averages of the New York

banks compare as follows with the same period in 1893 and 1892:

	December 8, 1894.	December 9, 1893.	December 10, 1892.
Loans.....	\$507,733,500	\$412,343,600	\$442,560,700
Deposits....	566,050,200	492,802,300	461,046,800
Circulation	11,185,100	13,602,100	5,536,200
Specie.....	59,170,000	104,909,500	77,714,600
Legal tenders.....	115,216,200	94,856,500	40,556,900
Total reserve....	\$174,415,200	\$199,766,000	\$118,271,500
Reserve required...	141,512,550	123,200,575	112,761,700
Excess reserve....	\$32,902,650	\$76,565,425	\$5,509,800

The money market has shown only the faintest improvement during the week under review. The drift of idle funds from the interior to this center continues unchecked, and is as large as it has been at any time this year, while the demand from borrowers is still tame. Money on call on Tuesday advanced from 1% to 2%, the majority of transactions being made at 1½%. Time money, while not quite such a drug, has been very easy. It is still offered in large volume, and the scrutiny of collateral is lenient, nevertheless, the demand for short time loans is small again. Rates are quoted at 1½% for 30 days, 2% for 60 days, 2½% for four months, and 3% @ 3½% for longer periods. A large loan is reported to have been made for four months at 2%.

The commercial paper market is quiet, owing to scarcity of good material and not to the absence of demand, which is excellent. Rates are unchanged and are quoted at 3% for 30 @ 90 days endorsements, 3½% @ 4% for high grade single names, and 4½% upward for others.

Sterling exchange has advanced steadily and was at the highest notch on Wednesday, when actual business was done at \$4.87½ @ \$4.88 for 60 days, \$4.89 for demand, \$4.89½ for cables, and \$4.86½ @ \$4.87 for commercial bills. Cotton bills have been very scarce. Domestic exchange on New York was quoted on Wednesday as follows: Boston, 20¢ @ 15¢ discount; Chicago, 30¢ premium; St. Louis, 50¢ premium.

The stock market in general has been dull and stagnant, with the almost single exception of some wild dealings in sugar certificates, which were dealt in last week to the extent of more than double the amount of the whole issue of these stocks. Friday, too, saw a slight increase of vitality throughout the market, due to some extensive coverings of short contracts. On that day prices advanced along nearly the whole line, St. Paul and the Granger group leading the rise. Since that day, however, the market has again settled down into a flat condition of waiting. The market has continued for the most confined to the professional speculative element; but commission houses report an increase in their orders in the last day or two. It is believed by the acuter observers that the stock market is about at a turning point, having touched its lowest level, and that its future trend will be upward. Meanwhile, it shows almost unrelieved dullness, closing, however, with a stronger feeling and prices a trifle higher.

The railway and miscellaneous bond market has been quite active, with transactions well distributed and a very general advance in prices. Government bonds have been firm and active.

Silver has undergone a sharp fall to 27½ pence in the London market and 60½¢ in New York. The decline is attributed to the failure of the expected Japanese demand. Exports of the

metal from New York during the week amounted to about 650,000 ounces.

As regards the condition of general business throughout the country, there has been little change, but a more hopeful sentiment appears to exist as to the prospects of trade after January 1. The retail holiday trade is causing brisk movement in certain directions, but wholesale business is not especially active in any line. Wheat has advanced slightly on unfavorable reports of the Argentine crop. Receipts of the grain are, however, larger than a year ago and exports less, so that there is little reason to anticipate any sustained advance in price. Corn is rather weaker on heavy receipts and comparatively small exports. Cotton, which fell last week to nearly the lowest point known, advanced this week on improved foreign demand. Receipts from the plantations and export shipments have been unusually large during the week.

British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, December 12, 1894.

Pig Tin sold at as low as £61. 5/ directly after date of last week's report, but the market has since strengthened and prices reached £64. 5/ for prompts. Heavy purchases have been made in settlement of short accounts and some bull support has also been given. During the last few days buying orders were large, while the offers showed some falling off. The market to-day was firm. Late sales at £64. 2/8 @ £64. 5/ for prompts and £64 @ £64 2/8 for three months' futures.

Copper has advanced somewhat in price and the market is stronger. Large purchases have been made by consumers, and speculative buying of futures has also been on quite a large scale. This, together with absence of American offering and some rebuying for American account. Fine sorts sold recently at easier prices, but are now strong and in demand. At the close Merchant Bars were quoted at £41 for prompts and £41. 5/ for three months' futures. Best selected English is about £43 @ £43. 10/.

Tin Plate market is without improvement. Only a moderate business is passing, chiefly at 9/6 for ordinary Cokes. Makers are willing to book well forward at present rates. Buyers seem uncertain and unwilling to commit themselves. There is more inquiry for Terns for forward delivery, chiefly at 18/ for double boxes. Buyers' offers on Siemens Plates are three half-pence lower. Exports last month 32,000 tons, against 26,000 tons in November, 1893. Shipments to the United States were 22,000 tons and 15,000 tons respectively. Stock at shipping port, about 250,000 boxes. Sellers' quotations at Swansea are as follows:

Bessemer Cokes, IC 14 x 20.	9/6 @ 9/9
Siemens Cokes, IC 14 x 20.	9/9 @ 10/
J. B. Steel Cokes, IC 14 x 20.	18/6 @ 21/
Terns, 20 x 28.	10/6 @ 12/6
Charcoals, IC 14 x 20.	

Pig Lead, sold lower early in the week, but the market has since im-

proved to £9. 10/ @ £9. 12/6 for soft Spanish.

Spelter is steadier at £14. 10/ @ £14. 12/6 for ordinary Silesian and in fair demand.

Pig Iron warrants have undergone very little change. Late dealings were at 42/5 for Scotch, 35/4½ for Cleveland and 43/6 for Hematite. Exports of Pig Iron last month were 72,000 tons, against 58,000 tons in November, 1893.

Electric Lighting in London.

The preliminary efforts of the city authorities of London culminated, in 1891, in the formation of the City of London Pioneer Company, the necessity for which may not be obvious to our readers at first sight. Its formation was due to the fact that a certain date had been fixed for the commencement of the works, and that if an actual commencement had not been made before that time the powers would have lapsed, involving the entire loss of the money that had been spent in obtaining the provisional order and in other ways. This company were afterward absorbed by the City of London Electric Lighting Company with a capital of \$4,000,000. The construction companies had to open and place the cables in 17 miles of trench, extending through 53 streets, between August, 1891, and February, 1892. The conduits consisted partly of the Callender-Webber bituminous casing and partly of iron pipe conduits. These latter were used for the high tension mains, and the bituminous conduits for the low tension distributing system. Each separate conduit was placed in a separate way. Great pains were taken to exclude gas from the street boxes. To this end the boxes were constructed of glazed brick laid in Portland cement, and the joints between the conduits and the walls of the boxes were carefully sealed in. All idle ways were plugged, and no drainage of the box was attempted, save in cases where the pipes laid for this purpose were certain not to serve as ducts for gas.

As laid the conduits contained room for mains capable of supplying 340,197 eight candle power lamps. This output will, of course, not be reached for some years, but the works have been designed so as to permit of this load being dealt with without involving any change in the system of distribution as originally designed. Forty-four converting points were selected, each of which is intended to serve a compact district immediately around it. Great difficulty was found in securing sites for these, as in the richer parts of the district, such as Lombard street, a square yard of ground space is valued at £1000, and in many other cases exorbitant rents were demanded for way leaves to give access to the converter houses, which it was intended to place underground. In two instances a way leave was obtained to construct an entrance to these stations through old graveyards, the actual substation being excavated under the adjoining footpath and roadway, and thus a fairly satisfactory site was secured. These stations were designed for a maximum output of 450 kilowatts each, and cost, including the capital value of the rent, about £3476.

The lamps erected in the city are big enough for a man to get inside. To give access for trimming and cleaning, the posts have holes alternately on either side, into which the trimmer

puts eight portable steps of light steel, by means of which he mounts, and which he removes as he comes down. As the result of some experiments, rippled glass has been used in the lamp tops, which, while cheaper than the ground and opal glass, also tested, absorbs less light—viz., 21.73 per cent., as against 25.18 per cent. for the opal, and 46.24 per cent. for the ground glass. The glass used is ¾-inch thick, and is thus not very liable to accidental injury. The bases of the posts are of an ornamental character.

The stock of the Minnesota Iron Company has been advanced 19 points in the last few days.

The House of Representatives has passed a bill amending the Interstate Commerce Law so as to permit railroad pooling under certain restrictions.

The work at the Watertown Arsenal is sufficient to keep the force there employed until the end of next June. Orders now in hand include five 8-inch disappearing gun carriages, six 12-inch mortar carriages and several 12-inch gun lift carriages.

THE STEWART IRON WORKS, formerly of Wichita, Kan., have removed to Cincinnati, Ohio, where their office and works are located on Sycamore street, between Seventh and Eighth streets. The works will be ready to supply orders for Iron and Steel Jails, Architectural Iron Work, Structural Iron Work, Iron Fence and Railings and House Fronts about January 1.

W. C. MILLS, buyer for the W. Bingham Company of Cleveland, and R. C. Rogers, manager of the company's House Furnishing Goods department, have resigned their positions to accept others with the Marshall-Wells Hardware Company of Duluth, Minn.

GREGOR MCGREGOR of McGregor, Iowa, died on the 28th ult. Mr. McGregor was a well-known Hardware merchant and had been for the past 25 years a prominent citizen of the town, of which his father, Alexander McGregor, was the founder.

S. L. ALLEN & Co., Philadelphia, Pa., in order to accommodate the trade in their line of Flexible Flyers, Flyer Sleighs and Flyer Coasters between now and January 1, have arranged to carry stock for their own account in New York City and also in Milwaukee, Wis., and will be pleased to give the names of their correspondents in those cities to any parties who can use this stock to advantage.

PETER A. FRASSE & Co., 95-97 Fulton street, New York, have had a line of Addis Wood Carving Tools manufactured specially for ladies and amateurs. They are made in regular numbers and patterns, but about 1¼ inches shorter in the blade, with correspondingly smaller handles, having an extreme length of 7 inches over all. They are put up in neat basswood polished boxes, with hinged cover, in sets of 6 and 12. The set of six consists of one each of Nos. 1, ½, ¾, 1, 1½, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. The larger assortment is made up as follows: One each Nos. 1, ½, ¾, 1, 1½, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

HARDWARE.

Condition of Trade.

WITH the near approach of the holiday season and the close of the year there is a perceptible falling off in the volume of business, especially as many of the travelers have returned home, and trade lacks the stimulus which their activity would give it. The smaller class of purchases are therefore limited to goods required for early sale and the replenishing of the assortment of fancy articles which are in demand during the holidays. Besides this class of business, however, there is a good deal of activity on the part of the larger buyers who are negotiating in regard to orders for future delivery, a matter which calls for careful consideration and scrutiny of the market, and the forecasting, if possible, of the course of business during the next few months. There is in many lines a disposition to defer purchases, buyers thinking that possibly the bottom has not yet been touched, and there being a very general impression that prices will hereafter rule low, as compared with those which have been current during past years. There has been little change in the tone of the market during the past week, and prices on many goods continue weak and somewhat irregular. In the course of the year there have been so many declines in price on staple Hardware, and especially in Heavy Hardware, that the annual inventory will show—it is to be apprehended—a shrinkage in the value of the stock which will, unless it is judiciously turned over, tend to curtail the profits of the year, which has been, in any event, to most merchants a somewhat unsatisfactory one. The improved condition of things throughout the country and the hopeful views which are justified in regard to the future course of business are, however, encouraging features of the situation.

The following report from Corbett, Failing & Robertson, Portland, Ore., was received too late for use in our last issue:

The trade for the year is pretty nearly done, and merchants in all lines are getting ready for annual stock taking. Still, orders are coming in and goods going out in fair quan-

tity, considering the season. During the past month the interior dealers have pursued the policy that has guided their action during the year, and confined their purchases to immediate wants. It is probable that stock in the hands of retailers will be lighter at the beginning of the new year than at the corresponding date of any previous year since 1890.

After an unusually fine fall the winter rains have begun, and farmers are plowing for their next year's crop. It is probable that while a large amount of wheat will be sown there will be a very considerable movement in favor of a diversity of crops. Farmers have realized very small returns from their wheat this year, and are beginning to understand that raising wheat is not the only thing to be done.

Collections have been very fair the past month and prices are well maintained.

Chicago.

(By Telegraph.)

The Shelf Hardware trade is more active than jobbers had expected. December seems to be unlike the usual closing month of the year. The fact that inventory season is approaching appears to have no effect upon the volume of business. A remarkable steadiness is shown in the character of the orders which have been received for several weeks past. It is gratifying to observe this feature of the trade. Considerable satisfaction is expressed with the careful buying of the past year or more, which has brought about such a condition of affairs. Retailers' stocks are replenished so frequently and so steadily that jobbers are likewise enabled to keep their stocks in much better condition. Instead of fluctuations in demand which cause stocks of some articles to be greatly increased and then held on hand for some time, all stocks have been kept under good control. The Tinware trade has been especially good, running very much longer than usual in December. One case is noted in which orders received for the first week in December were larger than for any similar period in seven or eight years. Individual orders in this line are now running larger and calling for more whole packages. The mild weather of the past two or three weeks has kept up the demand for Roofing Plates. Retailers are also beginning to call for Bright Plates. The Heavy Hardware trade, on the contrary, is suffering considerably from the mild weather, as this is the season when all classes of winter goods such as Sleigh Shoes, Toe Calk Steel, &c., should be moving freely. The stocks laid in

some time ago are lying in jobbers' warehouses almost untouched. Meanwhile other classes of their trade are quiet, owing to the approach of the close of the year. Collections in all branches of the Hardware trade are reported better than usual.

St. Louis.

(By Telegraph.)

Trade continues to keep up fairly well considering the season. Retailers are preparing to take their inventory and are necessarily limiting their purchases. The weather has been against any large business in winter goods, and any improvement in this direction can only be looked for with the return of cold weather. In some lines manufacturers are urging jobbers to buy for spring delivery, and as inducement are offering to shade prices quite materially. Under these circumstances they have succeeded in booking some fair orders. Wire Nails and Barb Wire are particularly weak. A large trade is reported in heavy Hardware, particularly from the South and Southwest. The trade at large are building their hopes for a heavy trade after the turn of the year, and it is hoped that they will not be disappointed. Collections are satisfactory.

Notes on Prices.

Wire Nails.—There continues to be a very good degree of activity in the Wire Nail market, many orders being received, and the volume of shipments large considering the time of year. There is also a good deal of negotiation in regard to orders for delivery within the next few months, and some large purchases have been made. Buyers are, however, showing a disposition to hold off a little. Prices continue without change on the basis referred to in our last report, namely, 85 to 90 cents for carload lots at mill. Some of the manufacturers are disposed to hold pretty steadily to the higher figure, but on large and desirable orders 85 cents is obtainable. Small lots from store in New York are held at \$1.20 to \$1.25, though these figures are sometimes shaded.

Chicago, by Telegraph.—Inquiries continue to be received for deliveries for the first quarter of 1895, and some factories have taken a great deal of business of this character. Others, however, are holding back in the hope that they may get better prices later, or if they fail in this they propose to diminish their output. Prices continue about the same as previously reported, factory lots selling in the vicinity of \$1, Chicago, which is shaded according to special

circumstances. Jobbers are quoting small lots from stock at \$1.10 or \$1.05 for shipment from factory, or \$1 for carload lots shipped direct from factory.

Cut Nails.—The Cut Nail market is rather sluggish and the volume of business moderate. Quotations continue on a basis of 75 to 80 cents at mill on carload lots, with 60-cent average. Carload lots on dock, New York, are held at 90 cents, but concessions are sometimes made from this price. Small lots from store are held at 95 cents to \$1.

Chicago, by Telegraph.—The demand is confined entirely to small lots. Manufacturers express satisfaction with orders of this character, asserting that they would not be willing to name present prices for long delivery, owing to the fear that raw materials may advance materially in value. Some shading has recently taken place in barrel Nails, but in a general way prices are unchanged. Factory lots are quoted at Chicago at 95 cents to \$1 for 50 to 55 cent average. Small lots from stock are selling at \$1.

Barb Wire.—The Barb Wire market is not in an entirely satisfactory condition, notwithstanding the fact that the volume of business is large and most of the mills have booked orders which will occupy them for some time. The price is, however, somewhat uneven and represented by the quotation of \$1.85 to \$1.90 for Four Point Galvanized in carload lots at mill, but these figures are shaded more or less freely.

Chicago by Telegraph.—The contracts taken by manufacturers during the past week, so far as can be learned, were not so large or numerous as during the weeks immediately preceding, but the output of the factories appears to be pretty well covered now for the winter months. Carload lots have latterly been moving quite freely. An encouraging feature of this trade is the orders to begin shipping which are already being received. Jobbers report a fairly good demand for mixed carloads and small lots from stock. Prices appear to be well sustained and are not as irregular as those prevailing in the Wire Nail trade. Jobbers quote Galvanized at \$2 for carload shipments from factory, \$2.05 for shipments of small lots from factory, and \$2.10 for small lots from stocks. The plain Wire market is disturbed this week by extremely low prices being quoted on contracts which are now coming up. Business is large, and the trade would be in good condition if it were not for the sharp competition for business.

Tacks.—The prices agreed upon by the leading manufacturers are pretty well maintained, but the market is somewhat uneven owing to the activity of outside competition.

Shovels and Spades.—The market for Shovels and Spades is not in a very settled or satisfactory condition, prices being low and rather uneven and weak.

Curry Combs.—The Curry Comb market is in a decidedly unsatisfactory condition, withdrawals from the American Curry Comb Company giving active outside competition. As a result, prices are somewhat lower and the tone of the market rather weak.

Bicycle Wrench.—Hulbert Bros. & Co., 26 West Twenty-third street, New York, are selling the Bicycle Wrench illustrated in our issue 29th ult. to the trade at \$30 per hundred, net.

Steel Sash Pulley.—The Fox All Steel Sash Pulley, described in our issue 22d ult., and put on the market by the Fox Machine Company, Grand Rapids, Mich., is sold at 25 cents a dozen in barrel lots, and in less than barrel lots at 30 cents a dozen.

Suction and Force Pump.—The Mosely Folding Bath Tub Company, 161 South Canal street, Chicago, Ill., are manufacturing the Mosely Suction and Force Pump which was illustrated in *The Iron Age* November 22. The Pump is sold to the trade at \$8.50, list, subject to a discount of 33½ per cent.

Glass.—The variation in the prices made by different manufacturers of American Window Glass is the principal feature of the Glass market at the present time. It is reported that some manufacturers have been carrying on a war among themselves, doing what injury to rivals they could, and that this state of affairs is largely responsible for the disturbance in prices which has existed for several weeks. Manufacturers are evidently tired of this unprofitable warfare, as it is understood that Indiana Glass makers have called a meeting for next week, at which time the disturbing conditions of the Glass trade will be discussed, and an effort will be made to advance prices. It is difficult to quote any fixed price, but Pittsburgh advises name from 88 to 88 and 20 per cent. discount for single and double strength Glass, as an average quotation for car lots at factory, except when unusually large quantities are wanted, in which cases better than 90 per cent. discount has been offered. Glass from New York jobbing houses is sold at from 85 and 10 and 5 to 85 and 20 per cent. discount for single and double strength. Trade is reported as not being up to that of last month.

The Annual Stock-Taking.

Continuing the discussion of this subject, we give below a description of stock-taking methods employed by experienced Hardwaremen, whose carefully prepared papers doubtless contain information and suggestions of service to the trade.

System of Taking Account of Stock.

As an inventory of stock is necessary for the ascertaining of a man's gains or losses in business, it is very desirable to have a method by which one can be governed in arriving at a definite determination in as short a time as possible and with the least inconvenience.

Complete Overhauling.

It is customary in our business to take an account of stock at or near the first of every new year. The stir among the clerks connected with this part of the work is noticeable about November 1, when there is a complete overhauling of all the stock, shelves are dusted and cleaned, goods that were lost sight of are brought to view, and everything in general is put into such order as will facilitate the work of the clerical force at the first of the year.

Taking Inventory.

The inventory or stock sheets which we use are arranged in numerical order, punctured for tying in covers and ruled, as illustrated by Fig. 1. About the first of the year we commence taking the inventory in the following manner: A force of men start at a given location in the building and proceed in a direct course, placing goods in their proper positions, separating the different numbers or sizes of articles, if they should happen to be disarranged, leaving the stock in a clean condition and in their proper

places. A second force of clerks who do the counting follow next in order. They are provided with tags or slips, upon which they write the quantities of stock. The tags or slips are then placed on the different articles corresponding to the numbers which they represent, this force following in the same course as those of the preceding force.

Price Book.

We are now ready for the clerks who transcribe the list of all the goods remaining unsold. It is at this point that the value of a well kept Price Book is realized. We keep a strict record of the cost of all goods bought, and these prices are extended in such a manner in our own price book that it can be discerned at once the cost of a gross, dozen or single article. Again, the cost of all articles is marked in characters and letters upon the goods, which alleviates the work to a very great extent. One clerk "calls off" the article, number or size, and price if possible; this is immediately "taken down" on the sheets, as shown in Fig. 1. It is impossible in this method of procedure to escape any article, as all the tags are removed by the last force of clerks, and if any should remain on the goods they can be traced immediately.

The Extensions

and recapitulation of stock is performed by the clerks in the office, upon whose exactness we depend for the correct value of stock on hand. Fig.

3 illustrates the form of our recapitulation sheet.

Deteriorated Goods.

Goods that have deteriorated by keeping we make a deduction on each

the clerks to get rid of this stock as quickly as possible.

Value of Goods.

We make one decided point in our method of pricing up the value of stock on hand. We believe it to be a

stock they have on hand. They look over their stock and are content in estimating the value and quantity of the different merchandise. If they continue to pursue this course it will only be a question of time when their bal-

Gross		Less Than	Value on Hand Jan. 1, 1894	Disct	List	Gross Total	Net Total
Doz	Doz	Doz					
5			Locks #480	20	4 80	24 00	19 20
	2		Mini. Knobs #1290	40 10	1 00	2 00	1 08
6 1/2		1	Fit Locks 480x2160x2280 Etc.	50 05	14 00	14 00	6 65
			Door Slaps	20	5 00	32 50	26 00
							529 3

Fig. 1.—Inventory Stock Sheet.

Gross		Less Than	Value on Hand Jan. 1, 1894	Disct	List	Additional Disct	Gross Total	Net Total
Doz	Doz	Doz						
		1	Grid Cages	50%	300	30	3 00	1 05
		2	Pen Knives	25	4 80	25	9 60	5 40
1			Cupl turns #1840	15	300	10	3 00	2 30
			Brass Knobs	60	2 25	10		81
								\$9 56

Fig. 2.—Inventory of Deteriorated Goods.

Recapitulation								Column No	Totals
No Sheet	Total Amt	No Sheet	Total Amt	No Sheet	Total Amt	No Sheet	Total Amt		Amount
1	14 28							1	543 85
2	301 27							2	
3	65 80							3	
4	44 20	Column 2	Column 3	Column 4				4	
5	118 30								
6	543 85								

Fig. 3.—Recapitulation.

article separately, and so specify it on a special sheet, as shown by Fig. 2. We keep this account of shop worn goods on a separate sheet, for the purpose of having them before our notice constantly. A copy of these sheets is given to each clerk, and we expect

good rule when goods are marketable to estimate their value at what it would cost to replace them at the time the estimate is made.

Careless Methods.

There are a great number of merchants who assume the amount of

ance will be on the wrong side. Our advice is,

Do Not Do It.

Upon inquiry among prominent business people, I find that taking an inventory of stock is being sadly neg-

lected. I importuned one merchant to take an account of stock upon one occasion, and after considerable argument I persuaded him to go over his entire stock on the plan herewith described. He could hardly realize the amount of dead stock, covered with dust, that he had on hand.

Going Backward.

Not only this did he discover; he always considered he was making money,

but when he saw the recapitulation of his stock sheets he was surprised to know that instead of going forward he was going backward. Now he is yearly taking an account of stock, and his experience has taught him a lesson which he never regrets. Our taking an inventory of stock is reduced to its simplest form possible, using as our motto three words, which we try to emulate: Briefness, conciseness and exactness.

Bicycles for 1895.

In the following columns we give further information in regard to prices and patterns of wheels which will be put on the market by manufacturers during the coming season, with special reference to the Hardware trade. We also give articles which contain practical suggestions in regard to handling this line.

MANUFACTURERS are taking much interest in the Bicycle shows to be held in New York and Chicago near the first of the new year. There will be a large exhibition of machines and of specialties for the season of 1895, including tires, rims, sprockets and other new features. The manufacturers of Bicycle sundries will also make a large display of their products. Bicycle shows have reached a point where they are of national importance to Bicycle riders, and for this reason Hardware dealers cannot afford to ignore them. No such opportunity is elsewhere offered of seeing the machines of leading manufacturers together, and of comparing their points of excellence and their adaptability to the requirements of riders in the various parts of the country. They also offer an excellent opportunity of gaining information regarding the opinion of riders from remarks dropped by them in conversation with each other, and with exhibitors. A careful, obtrusive man can, without doubt, pick up more points and get more general information relating to the Bicycle trade in one or two days at either of these shows than would come to his knowledge in a long time in the ordinary routine of his store.

OVERMAN WHEEL COMPANY, Chicopee, Mass., issue a handsome and well arranged catalogue, with embossed cover, devoted to their 1895 line of Victor Bicycles. Among the new special features of the Victor are shown the hollow crank axle, the manner in which the sprocket hub is made a part of the crank axle, thus doing away with the crank key, and the improved form of pedal. Attention is also directed to the reduced width of the tread, which has been made possible by the new form of crank axle. The company also issue a Victor pad calendar for 1895, with metal back, containing one leaf for each day, with blank space for memoranda, at the top of which are appropriate quotations on a variety of topics. The calendar, the manufacturers advise us, will be forwarded to any address upon receipt of 10 cents in stamps.

THE WALTHAM MFG. COMPANY, Waltham, Mass., and 194-196 Columbus avenue, Boston, will make the following Orient Bicycles for 1895: Racer, weight, 16 pounds, list \$125; light roadster, weight, 19 pounds, list \$115, and full roadster, weight, 23 pounds, list \$100. The manufacturers remark that C. H. Metz, president of the company, is a Cycle mechanic of the first order, and that riders can rely on his handiwork fulfilling all promises. They also remark that agents who desire to handle a line which will meet all requirements of the high grade trade should make early application for territory.

MARION CYCLE COMPANY, Marion, Ind., show in an illustrated circular the Halladay-Temple Scorchers and the ladies' H. T. Scorchers. These machines will weigh from 17 to 25 pounds and list at \$100. A Halladay-Temple Racer is also made, weighing from 17 to 20 pounds, listing at \$125. The company state that the Scorchers wheels, though several pounds lighter than those made by them during 1894, have more strength, owing to the mechanical improvements of design and construction. Ralph Temple Cycle Company, 2208 Michigan avenue, Chicago, will handle all agencies in Illinois and the Western States, and all correspondence from Indiana and the States East should be sent to the factory at Marion, Ind.

CURTIS-CHILD MFG. COMPANY, Philadelphia, Pa., issue an illustrated circular of solid comfort Saddles for Bicycles of which they are the manufacturers. A number of new Saddles are introduced for the coming season, including track racer, extra heavy roadster, and roadster and scorcher. The company state that they guarantee each part of their Saddles and make good any broken part or parts returned to their factory.

The Elliptical Spring Cranks, patented and manufactured by the F. F. IDE MFG. COMPANY, Peoria, Ill., which have been fitted only to their own machines during the past season have proved such a success, we are advised, and there being such a large demand for them from riders who wish to use

them on other machines, the Ide Company have decided to place them on the market at \$5 per pair. Parties who have the agency for the Ide wheels will also have the exclusive sale of the cranks for the same territory, which the Company think will prove of advantage to the agency.

THE BIDWELL TINKHAM CYCLE COMPANY, New York, announce that Ernest F. Walton, formerly general manager of the Wickes Refrigerator Company, has been elected vice-president and general manager, with large interests, of the cycle company. The addition to the management of the company is considered valuable, as Mr. Walton is known as a man of large business experience and enterprise. The company state that soon after January 1 they will open branches down town in New York, and also in Brooklyn, and that they will establish an instruction hall and branch store at Newport, R. I.

THE PERFECT BICYCLE LOCK COMPANY are arranging to begin manufacturing operations at Coldwater, Mich. They have purchased their outfit of machinery and have already made contracts for a portion of their products. T. A. Hilton is president, H. S. Roe secretary and Roll Hayden treasurer of the company.

KNAPP & SPALDING COMPANY, Sioux City, Iowa, wholesale dealers of Bicycles, sporting goods and Hardware, have bought a complete line of wheels of representative manufacturers, and have also arranged to carry a complete line of parts of all machines handled by them, together with a full line of sundries. A circular letter to the trade calls attention to the fact that Bicycles as a line will work in well with the Hardware business and points out the advantages of buying these goods from the jobber, including prompt shipment and lower freight than when ordering from distant factories. The company have been identified with the Cycle trade for several years and control Iowa, Minnesota, Dakota and Nebraska on the line they handle.

A Hardware Theft.

FOR the past year and a half the John Pritzlaff Hardware Company of Milwaukee, Wis., have been systematically robbed by a dishonest shipping clerk, who as a trusted employee had been with the company about four years. The clerk's plan of operation, it has been found, was to secrete in his lunch box during the day small articles of value, including pocket cutlery, rules, files, &c., which could be packed in a small space, and on his way home at night leave them with a small Hardware dealer who paid him 50 cents to a dollar for each lot of goods. The company had received complaints from their traveling men for more than a year, that this small dealer was selling Hardware to retail merchants in Milwaukee and throughout the State at prices lower than the cost of manufacturing the goods. Some of the goods sold by the dealer were examined and found to be of the same quality and makes as were carried by the com-

pany. The dealer did not buy any goods of them, and this fact led the officers of the firm to believe that the goods which were being sold so cheaply were stolen from them. When sufficient evidence had been obtained by the detectives into whose hands the matter was placed, the clerk was arrested one night on his way from the store, and in his lunch box was found 6 dozen two foot rules, valued at about \$10. He admitted that he had stolen them and that he was then on his way to the dealer's store to dispose of them. His arrest and confession was followed by the arrest of the dealer and his son, and about \$500 worth of the stolen goods, which had not been disposed of, was recovered. The clerk when confessing his crime stated that about a year and a half ago the son of the dealer, then an employee of the company, proposed to him that he steal goods and take them to his father's store. To this arrangement he said he consented, and since then he has packed light Hardware in his lunch box during the day time and disposed of it to the dealer in the evening. He said that he had always stopped at the store before going home at night, and although at times he left goods there worth \$15, the Hardware dealer never gave him more than 50 cents or \$1 a night for the entire lot. He further stated that he did not realize more than \$300 from his thefts, although he may have stolen thousands of dollars worth of goods. The company are unable to state at present how much they have been robbed of, but are making a thorough investigation.

Bicycles in Hardware Stores.

BY A. STAINFORTH.

THERE is no doubt that successful Hardwaremen make the best Cycle salesmen and more particularly if the man having charge of this department is a rider and takes pains to understand the machine he represents, so that he can explain its good points intelligently to would-be purchasers. Enthusiasm in any business or enterprise is a sure foundation for success and in any branch of business which caters to the sporting or recreative proclivities of men enthusiasm on the part of the salesman begets a like feeling and sense of trust in the customer.

All Sorts of Salesmen.

There is a peculiarity about the marketing of Bicycles not observable in any other business, in that we find all sorts and conditions of men selling them; insurance agents, physicians, editors, bank clerks, school teachers, &c., may all be found upon the ledger of some Bicycle manufacturers, but how few of these people have any mechanical knowledge or can speak of the merits of a Bicycle in an intelligent way? The Hardware business begets in its employees a certain mechanical knowledge whether they desire to learn it or not and there are few indeed who would not be able to explain the advantage of having Jessop's tool steel bearings over those used upon the cheaper grades of Bicycles; while another but minor point favoring Hard-

ware stores is the fact that mechanical advice and assistance can often be obtained when repairs are needed which the average insurance agent or school teacher could not give.

Bicycle Sundries.

Wherever Bicycles are sold an assortment of the most prominent sundries should be kept. Quantity cannot be stipulated, as demands vary greatly in various districts and the true capacity can only be arrived at by test and experience. The laws of one township may call for lamps and bells, which may be unknown in another section of the country. These articles can be purchased so readily from wholesale agents that it is not advisable for the retailers to keep a large stock, as the patterns change every season and Bicycle riders always want everything up to date. I should recommend those contemplating the addition of Bicycles to their stock in trade to begin cautiously. It is better to buy six wheels and sell six than to buy 20 and sell 10, as carrying Bicycles over a season means loss—dead loss—a depreciation of one-third on the list price of the average wheel. Where pneumatic tires are fitted the tires if kept inactive for a year will be practically worthless, as rubber deteriorates rapidly when at rest. Therefore let it be borne in mind that no orders should be placed except for wheels which the dealer feels sure of selling in one season, otherwise Bicycles will be a millstone about his neck.

Grade of Bicycles.

It is not wise to handle several different makes of wheels, excepting in large cities where riders are numerous and well posted. Let the agent handle two or three patterns if he will, but he should avoid the prices clashing—that is to say, he should not offer more than one make at \$100, one at \$75, &c. He can then suit his customers' tastes and pocketbook. The only case in which this rule can safely be relaxed is when the weights vary to any marked degree, as, for instance, two Bicycles at \$100 may be safely kept in stock when one weighs 25 pounds and the other 32 pounds, this to suit the various weights of riders.

The Best Methods

of stimulating the sale of Bicycles are to join or organize a club, and ride out with the members; to promote races; to keep a wheel of the pattern you are agent for, and to allow the boys to try it; to have copies of the various cycling journals where the riders of your acquaintance can read them, and to advertise locally, but not run down other wheels. A live agent who has been wonderfully successful told the writer that he attributed a large part of his success to an idea of his own, which, although entered into as an experiment, had been productive of the best results, which was as follows: At the beginning of each season he buys outright half a dozen of the latest pattern of the wheel which he

represents. These he hires out new by the hour to reliable patrons. He claims that more sales of this particular pattern of wheel have been made by him without a word of inducement than he has been able to make by talking the "points" into his customers. Although his plan involves considerable outlay, he more than reaps his reward by the end of the season.

Repair Department.

As the craze for light wheels increases, breakages are likely to become more numerous. It is well known that pneumatic tires are, even after years of experimenting and perfecting, far from perfect, and that the repair of tires is among the most important items in the repair shop. Whether it is necessary to have a repair department is dependent largely upon the number of wheels in use in the vicinity. The expense of properly fitting up one is considerable if it is intended that every branch of the work is to be done. In small towns it is not to be recommended, unless there be some one who could act as salesman and could repair a tire or true a wheel as well. Brazing work, enameling or nickeling can generally be done by the manufacturer at lower rates than the average repairer can afford to make; while tire manufacturers are generally willing to keep their output in repair for a year when expressages are paid by the owner. The situation is different in cities where riders are numerous. Many mechanics who under ordinary circumstances could earn but \$15 per week in a machine shop find a valuable business in keeping wheels in repair in large cities. In connection with the repair shop the writer would suggest that a system of checking be adopted, and that tags with a number upon them corresponding with a number upon the "repair book" be attached to each job when it is brought in, and the repair instructions on the tag be made to correspond with the book. This tag should not be removed until the job is finished and turned over to the owner after payment has been made. It is well to give the owner of a bicycle brought in for repairs an approximate idea of the cost of the work necessary, as few riders are aware of the charges made by manufacturers for parts, and in many cases objections are made to paying what may appear exorbitant prices.

The Installment Plan.

Before closing, the installment plan of payment should be discussed. No dealer should let wheels go out on small payments; one-half list price down is none too much, and prompt payment of the installments as they become due should be insisted upon. The present year has been, in some instances, a disastrous season for those who let wheels go on too easy terms; second-hand wheels have had to be taken back upon which perhaps only one-quarter of the price had been paid.

It should be borne in mind that a season of depression such as we have passed through will deprive many of the means to pay for their wheels—an event which cannot well be foreseen; it is, therefore, advisable to secure a first payment which together with the probable value of a second-hand wheel will give the dealer the profit he would make upon a spot cash sale. In conclusion, I would say that there is everything in the favor of Hardwaremen handling Bicycles, but some of the secrets of success are as follows: Don't carry a stock over into a second season; don't do an installment business on small payments and long periods; don't handle too many makes of Bicycles; don't fail to be enthusiastic, and don't sell a wheel if you haven't confidence in it.

The Question of Bicycles.

BY H. P. KING.

TO THE AVERAGE retail Hardwareman the subject of Bicycles is a source of much discussion. He realizes that Bicycles are in demand and that a good profit can be derived from their sale; he wants to handle them, and as he ponders over the matter he finds his mind filled with

Objections.

Undoubtedly there are objections, but there are many objections to other lines of goods also, and the only reason that Bicycles present so many difficulties is because the subject has not been given sufficient thought and its adoption as fair a test as is given to other new goods. The first question that arises is the amount of money involved, and that can only be settled by the dealer's decision as to how he will handle the Bicycles, whether he will be a leader or a straggler. Granted that he is on the lookout for increased business and profits, a man whose enterprise and enthusiasm are curbed by conservative judgment—by such a one the Bicycle line can be made a very successful and profitable addition to the business.

Space.

One of the first items that arise in connection with the subject is that of space. How often is heard the remark: "No room. Where can I put them?" It is the same old question of crowding a full car, and is always solved by moving up or out. Give the Bicycles the preference among seasonable goods, even to the crowding of the others which have been introduced and advertised during previous seasons. If necessity requires, and it is sometimes practicable, clean out a line of goods that has ceased to be profitable through lack of interest on the part of the public.

Assortment.

The question of what line or lines of Bicycles to carry is, indeed, a vexatious one and affords an opportunity for study and experiment. But no decision can be reached in this matter without a knowledge of what other dealers are doing and the qualifications of their various machines.

High Grade.

The best Bicycle that can be bought will always find buyers, and on general principles it is well to have a cheaper one, not only to supply a demand but to aid in showing the points in favor of the high grade machine. As to sizes and styles to be kept in stock, the dealer must use his judgment and consider the surrounding markets, the prox-

imity of the manufacturer and the time required to receive goods ordered for special customers. The greatest source of annoyance to the retail Hardwareman who deals in Bicycles is

The Exclusive Dealer

who sells nothing but Bicycles. He has an entire store with, perhaps, a practice track; he disposes of his ma-

city or town a repair department can be maintained with profit, but in small places the easiest and best course to follow is to depend upon the factory for parts needed and send the machine to some general repair shop to be put in order.

Accessories.

With every bicyclist his desire for accessories increases with his knowl-



A Unique Window Display.

chines on the installment plan; he takes old Bicycles as a part payment for new, and rents or loans whenever opportunity occurs. This looks like hard competition to the retail Hardware dealer and impresses him as a drawback; but notwithstanding the various methods of his competitor the Hardwareman can adhere to the same principles that control him in other lines and handle Bicycles with satisfying success.

The questions of selling, keeping supplies and furnishing repairs may all be settled by controlling circumstances. But the best result in the matter of sales is brought about by having a clerk in the store who is interested in Bicycles in general and belongs to the L. A. W. or the local club. He will have a machine from the store and ride whenever opportunity offers. Among Bicyclists and other acquaintances he is an advertising medium unequalled, and the results are shown by his customers.

An Interested Salesman

will try to keep track of the Bicycles he sells, as a matter of information on the wearing points of the machine and to aid him in giving his customers full satisfaction. To accomplish this he impresses the customer with the idea of coming to the dealer for any repairs that may be needed, and of course some provision must be made to supply them.

Repair Shop.

Repairing is almost a trade, and requires some mechanical skill in addition to Bicycle knowledge. In a large

edge of his wheel, and as dispositions differ, so will the wants vary until almost every Bicycle sundry will be in demand. There's money in these supplies; why not handle them?

The use of Bicycles is becoming almost universal. The fact of the old style being so quickly superseded by the new is sufficient testimony as to the popularity of bicycling, and as time advances the demand will increase to keep pace with the increased number of practical purposes for which the machine will be used. With the permanency of the Bicycle established there is no reason why the retail Hardwareman should not have his share of the business the same as he does in other goods.

A Unique Window Display.

DURING a presidential campaign an ingenious Hardware merchant of St. Louis arranged a window display, which is represented in the accompanying illustration. A board back of suitable size was covered with black material, and Tools, Chain, &c., were fastened upon it with good effect. Calipers, Dividers and Auger Bits were selected as best suited for the purpose, while Jack Chain artistically festooned formed the whiskers. The face attracted much attention and drew forth many complimentary remarks. The exhibit is

referred to by our correspondent as an effective and successful window display.

Arrested.

IN *The Iron Age*, November 29, we referred to the fact that John C. Clarke, Chambersburg, Pa., had been defrauded by a man who passed a forged check upon him, this being one of a number of similar offenses of which persons in the Hardware trade have been the victims. Mr. Clark has been industrious in efforts to run down the criminal, and several days ago succeeded in capturing him, and he is now in jail at Chambersburg. It is not unlikely that measures will be taken which will involve a discontinuance of his nefarious operations for some time to come.

Trade Items.

WILLIAM SCHMITT & CO., Newark, N. J., manufacturers of Plumbers' Tools, House Furnishing and Kitchen Utensils, &c., have appointed Robert Murray, 24 Duane street, New York, selling agent for this and nearby territory. A stock of these goods is being carried at the New York headquarters with which to promptly fill orders.

WASHBURN & MOEN MFG. COMPANY, Houston, Texas, shipped on December 1 a solid train of Waukegan Barbed Wire to a firm at San Antonio, Texas. This is the second train load of Waukegan Barbed Wire shipped to the same firm.

THE UNION METALLIC CARTRIDGE COMPANY, for whom Hartley & Graham, 313-315 Broadway, New York, are agents, are distributing among their customers a neat felt mat, 11 x 14 inches in size, which will be found useful on top of glass show-cases, for laying Revolvers and other metallic articles on. The background is yellow. At the top are the initials U. M. C. Then follow on one of the mats the words, in distinct black letters: Paper Shot Shells, New Club, Black Club, Nitro Club, Smokeless, Walsrode, Trap. The other mat calls attention to Metallic Ammunition, Percussion Caps, Primers, Wads, Loaded Paper Shells, Empty Paper Shells. The first mat is lettered in green, the other in red, with borders to match.

THE FIRM OF BOWEN & BEACH, manufacturers of Patent Corrugated and Standard Soil Pipe, Fittings and Plumbers' Castings, Medina, N. Y., have been succeeded by Beach & Co., Mrs. E. A. Bowen having disposed of her interest to the other partners, Geo. A. Beach and Chas. J. Beach. The business will be continued as heretofore under the management of Geo. A. Beach.

OUR READERS will observe the announcement of Taylor Battery Company, 79 Cortlandt street, New York, in which they make a special offer of 40 per cent. discount on Electric Launch Outfit and Reading Lamp Outfit. This offer, it will be observed, holds good until January 1.

IN *The Iron Age* of November 22 we published a paragraph to the effect that the Dillon-Griswold Wire Company of Sterling, Ill., had certified to a decrease in capital stock to \$15,000. This was, however, in error, as the present capital stock of the corporation is, we are advised, \$150,000.

UNDER DATE of December 4 the Ette & Henger Mfg. Company, St. Louis, Mo., announce that they have changed the name of their corporation to the Pleuger & Henger Mfg. Company. It is stated that this involves

no change in the management of the company and that they are making the same line of goods as heretofore. The company are prepared to fill orders promptly, and call attention especially to the quality and finish of their manufactures.

THE ANNUAL HARDWARE DINNER will be held at the rooms of the Hardware Club of New York on Thursday evening, January 31, 1895. A. D. Clinch has been appointed chairman of the committee of arrangements in connection with the dinner. Mr. Clinch will have as associates Eugene Bissell, E. C. Van Giahn and J. L. Varick as a sub-committee on menu, rooms, &c.; Brace Hayden, R. R. Williams, J. H. Kennedy and W. R. Walkley, as a sub-committee on speakers and toasts, and Peter McCartee as a sub-committee on reception.

Inventory Methods.

BY E. D. WARNER.

AS THE CLOSE of the year draws near every progressive business man desires to know more accurately than can be determined by daily sales his exact business standing in relation, not to the community, but to himself. The question of to what extent money has been made or lost, or the value of the business as a whole, can only be determined by taking account of stock at stated intervals and the comparison of the results obtained with those of former years.

Its Object.

A systematic inventory taken annually or oftener is, from the competition met with on every hand, a prime necessity. Its object is to discover one's exact financial condition, and to use this knowledge of his resources as a basis for future plans and work. The methods by which this end is attained have changed greatly within the last 30 years. Before then, outside of the large cities, little emphasis was laid upon the importance of a systematic inventory. Even when taken, the methods being slack, the results as basis of calculation were nil.

One Method.

Too many accomplished it, as did a firm still doing business. Come the first of the year, one would say to the other, "Well, Mr. S., isn't it about time we took account of stock?" Beginning at one end of the store, each would jot down what he thought the goods under question were worth. Then, taking a mean between the two estimates as definite value, they continued the process until the task was done. Footing the totals completed the inventory.

But now all progressive merchants desire such a system as will give a thorough, accurate knowledge of stock, priced and extended, in the shortest time possible. That method which is best must combine accuracy and speed with thoroughness. Methods usually vary according to the size and complexity of stocks. A wholesale stock with items in full packages arranged by system can be taken in proportion-

ately less time than in retail, where much detail necessitates greater labor of preparation.

Underlying Principles.

Yet in both cases, with similar underlying principles, the methods of application will differ but little. No rule can be laid down that will conform to all conditions, but such a method as shall give us principles that will underlie, systematize, and simplify inventory will, while relieving much of the burden of it, make it of greater value and aid to business. The principle that will do this is such that stock shall be systematically kept up, clean, to the front and in order at such short periods as is most convenient. This, if followed by making each responsible for his part, will enable any store to be kept bright, attractive and in excellent condition for business and for quick stock taking, while avoiding to large extent the gross accumulation of shopworn goods. It also dispenses with much of the preparatory labor and annual cleaning usually associated with it.

Present Actual Value.

This, then, points the inventory to what it really is, an itemizing of stock and accounts to find their present actual value. In small or unorganized stocks invoicing is usually done with little regard to system, each item being taken down as it comes at marked price. Besides taking a great deal of time this method, such as it is, gives entrance to much error, allowance seldom being made for depreciation of price in market changes or of value in goods. In inventory, as in business, not size but system secures accuracy and speed, as it reduces friction and gives time a greater value. Organization and business go hand in hand. With system a large and complex stock can be inventoried in far quicker time than a small simple stock without it. Given a store kept up systematically largely doing away with the hard, laborious work of "house cleaning," and the sorting of mixed goods brings us to the real act of invoicing. Preparatory, however, if possible, reduce stock by special sales.

Preliminary Work.

In beginning inventory, if unorganized into departments, divide the stock into sections according to kind, or, if from the arrangement of goods this be impracticable, as is most convenient. If the force is small detail certain ones a few days before taking down to go carefully over assigned sections, arranging stock in order, and stray articles in place, filling and noting broken packages, and in weighing, counting, or measuring goods in bins, boxes or rolls. The time necessary will vary from two days to several, according to extent, but especially as to whether or not the care of stock has been systematized. As each section is gone over watch carefully for goods shopworn, defective or out of date. Bring such to the front, and if they cannot be made bright and new, keep

at them until worked off. If slow sale at one price reduce until they do move. Be not frightened by first cost. Money these days is made not in wide margins of profit, but in keeping capital active, selling close, turning slow articles into cash and reinvesting. Goods of this nature often make good leaders for advertising purposes and special sales. Keep all goods in sight as far as possible. If pressed for room arrange broken packages in front, full ones behind, so as to be readily counted. In counting begin with stock goods, broken packages first; follow with items in quantity like bolts in bins, iron in racks, and articles in rolls that take time to count, weigh and measure. Follow with shelf boxes and the like, leaving goods easily reckoned and such as are in most demand till the last. Keep track of quantities by slips projecting from between packages, left in bin or box, or fastened at side until called off, when they are destroyed. Have of such shape and size as will allow best to note amount, kind of goods, with price, as well as space to note articles sold, which should be entered thereon when taken out. Then the exact amount of each kind, with price when given, can be called at sight.

Section by Section.

With the stock thus prepared and on slips the labor and time of booking is greatly lessened. While so doing close if possible; if not practicable, detail one or more as necessary to wait upon trade. Devote the rest of the force to the matter in hand, taking stock section by section. Well systematized and divided into departments, which are but a development of the section and to which the same method will equally apply, a large stock with sufficient help to detail two men to a section of the department can, by closing, be inventoried in a day. The immense retail stock of Marshall Field's, in Chicago, by following the principle and methods herein given, is taken down from slip to book in a few hours.

In taking down assign two to each section, the one who has gone over the section to call off, the other to write, the latter keeping oversight the while that nothing is skipped. Call the goods in each section as far as possible according to kind and in regular order. Liability to error is thus reduced to a minimum.

Inventory Book.

If the stock is small so that one writer continues throughout, get a book about as long again as broad, which should be ruled for margin, quantity, kind of goods, price and extensions. The margin is useful for checking things that need pushing, and for indexing each section as taken by kind and number, to indicate location and contents, in case of reference. So in locating an article in "Shelf Goods, Section I," it can be found readily, and *vice versa*. When entered call back after each item to avoid error.

Inventory Sheets.

If the stock is large, with sufficient help, assign caller and taker down to one or more sections, the sheets as filled being transferred at office to invoice book. This, however, entails much extra time and labor. What is better is to have a book to several sections, thus facilitating pricing and extending. One of the best ways, however, is to take down upon sheets of convenient size, then send to office, where price, extend and file, according to section, the whole, when not too bulky, being fastened as bills often are through holes at top or side and then filed away. This, while saving time, will put in convenient form and allow of ready reference.

With stocks divided into departments the application is similar, each being considered as a section and taken into books or filed as above. If the departments are large each may readily be divided into sections, a like course being followed as before. The same method is also applicable to wholesale establishments. Whenever inventory extends beyond the given day jot down in a note book all goods sold and not inventoried, the amount of which when extended being added to the total. Care should also be taken against invoicing new goods. Whenever, for any reason, one is unable to note upon the slip goods invoiced and sold previous to the date, they should be entered in this book and their sum subtracted.

Accuracy and Thoroughness.

While this system gives practically the nearest approach to realizing our aim of making inventory thorough, accurate and speedy, still accuracy must not be sacrificed to speed. One prominent Hardware firm in response to inquiry as to their method writes: "We would say that we do not believe a correct inventory was ever taken yet." Another, one of the largest retail houses in the West, adds: "We have never yet been able to satisfy ourselves." The essential to accuracy is thoroughness. The tendency is to take too much for granted. It is human nature to jump at conclusions, and to slight work that calls for much labor of detail. It is easy to call off a front door set, with strike plate missing, complete, with the idea of future repair, but it should never be done. It should be fixed then and there, or taken at a lower price. When goods are crowded it is not easy to sort aright; when packages are broken open it takes effort to satisfy oneself that nothing has been taken out, but it ought to be done and pays to do it. Inventory is valuable only as it represents not what one thinks, but what one knows to be the truth regarding his business. Self deception, however slight, is the forerunner of failure. Impress upon self and clerks alike the prime necessity of accuracy and thoroughness. Yet that is no reason why one should be slow; it is largely a mental habit. If stock is kept in

order systematically each day, accuracy and speed are readily attained, but if system be slack, then inventory entails twice the labor necessary, while making accuracy difficult.

Pricing Inventory.

Pricing is of the first importance. All goods when received should be marked with cost before being put away, the price being read from sample, box, or better, called from slip with amounts. Should there be shrinkage in price, follow with a question mark (?) and look up latest quotations. Whenever there is the least doubt look it up, as goods should always be invoiced at lowest market price, no matter if much below the marked. If the price has advanced enter at the first cost, as profit should be reckoned only on goods sold. Old stock, when inventoried, should always be priced at what the article would bring at forced sale. If stock changes rapidly in large quantities at variable prices, pricing is best done at the office by the aid of a quotation book, fluctuations in the cost of articles being noted as they occur. This also is a great aid in buying.

Short Cuts.

In inventory guess at nothing, for it admits error, but whenever possible use short cuts in counting and figuring. Count things not singly, but in groups, as in threes and fives. There are many printed lists giving weight of sheet iron per sheet, of bar iron, of tire the set, the length of belting by the roll, &c. With pipe of different lengths measure one and get the others by comparison. A little thought will enable one to devise many short ways of doing things in both store and office.

Book Accounts.

The stock may be carefully and accurately taken and still the inventory be a false statement of one's actual condition if the office accounts be overestimated. All accounts should be itemized, only those absolutely good being taken at their full value. Those somewhat doubtful take at a discount, for you will probably lose something in getting them. Such as you know to be bad had better be charged up at once to profit and loss. If secured in time you will be pleased; if otherwise you will not have to be disappointed or self deceived as to one's actual standing. Allowance should also be made for depreciation in the value of stock, such as one's experience has shown it to be, for interest upon investment and the like.

The Result.

While no rule can be given that will apply under all conditions, still the method of keeping stock up systematically, of keeping record upon slips and calling therefrom as given, experience has shown will enable one, with such changes as special conditions demand, to take inventory with accuracy, thoroughness and speed, conditions to which every good method must conform.

Store Arrangement.

Scotfield & Co.

THE ACCOMPANYING CUTS relate to fixtures and methods in use in the Hardware house of Scotfield & Co., Sturgeon Bay, Wis., and will convey suggestions which will probably be new to many of our readers. The rack for Paint, Varnish and Oil, shown in Fig. 1, has been in use by them for over three years, and has proved very satisfactory. The company refer to the arrangement as a great improvement on keeping the goods in cans, papers and boxes, in which case the contents dry up and evaporate, or spill and get mixed, besides being inconvenient to get at. The Varnish and Oil cans were made in the company's shop by their workmen, of good heavy tin, using Perfection faucets, 3-inch screw caps and glass cream can gauges soldered in front, so that the contents of the cans may be seen at a glance. The cans are 9 inches wide, 12 inches deep and 17 inches high. They are painted with green carriage paint and neatly lettered. A pan is used underneath to catch the drip and to hold measures and funnel. One can is used for each Raw and Boiled Oil and Turpentine for small trade, saving many steps to and from the back room or basement for 5 or 10 cents' worth of the goods. Dry Colors are kept at the left of the cans. The bins at the bottom have lift covers similar to grocers' bins, while the small drawers above are used for finer Colors. Above the Oil cans Varnishes are kept in original packages. The case is an extension of the shelving and is located at the rear of the store room.

The display stand in Fig. 2 is used in one of the show windows for exhibiting tools and other small goods, the illustration representing the stand as it would appear to a person on the sidewalk. It is made largely of gas pipe and fittings, with a board platform resting on the lower standards.

Figs. 3, 4 and 5 represent price tags used in several departments of the store. One of these is for Guns, another for Stoves, and the one shown in Fig. 5 is used for various lines of goods, such as Bicycles, Refrigerators, &c. The tags are found very convenient, as from the information given on them a salesman can talk intelligently of what he is selling. On the back of each tag the following is printed with a rubber stamp:

FROM
SCOTFIELD & CO.,
HEAVY AND SHELF
HARDWARE,
STURGEON BAY,
WISCONSIN.

The tags are made of linen, so that they do not come off the goods.

Another interesting feature in this establishment is a system of electric

bells, which are used to good purpose. A push button is located near the center of the shelving on one side of the store, so that in case of a rush of customers, employees from the shop, basement or warehouse are called as they are wanted, each answering to a certain number of rings. Push buttons are also placed in the office and at the cashier's desk, and if the clerks are busy in another part of the store the entrance of a customer is announced by the cashier pushing a button.

Hints on Window Display.

THE window, the counter and the shelf offer the greatest opportunities for profitable advertising, seldom overestimated and most always underestimated by the storekeeper.

A well arranged show window is a guarantee that the goods contained therein will be seen and appreciated by the passersby.

There are two methods of window dressing, both good, but one should never be used exclusively, for in the

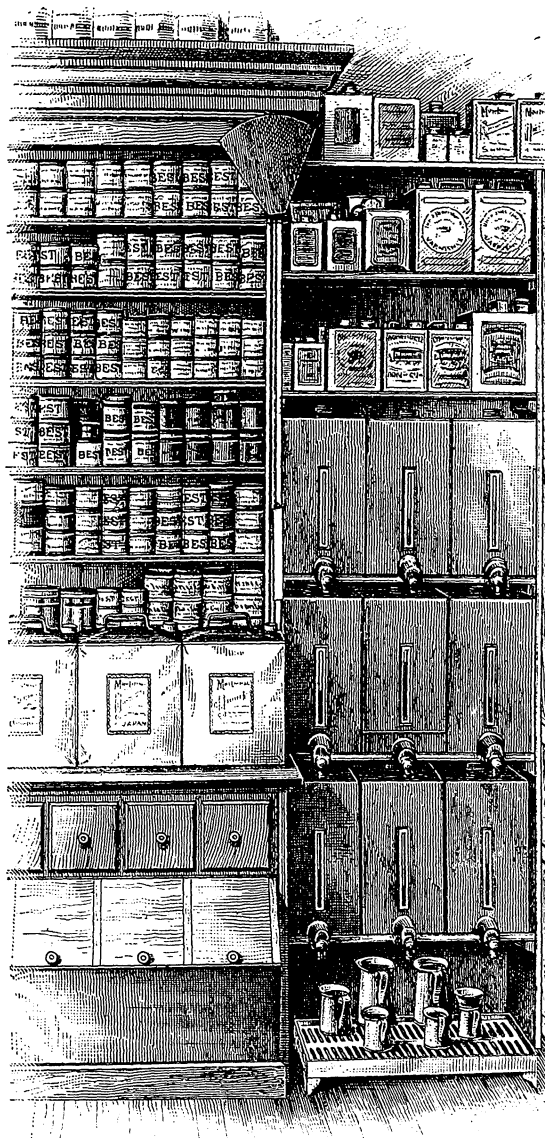


Fig. 1.—Paint, Varnish and Oil Case.

The whole establishment evidences the care which has been given to its arrangement, and in all departments an excellent system is followed, securing the convenient accommodation and attractive display of a large and varied line.

THE BIGGINS-RODGERS COMPANY have recently begun business at Wallingford, Conn., as manufacturers of Silver Plated Hollow Ware and novelties, Knives, Forks, Spoons, &c. The concern occupy a new building 35 x 110 feet, two and one-half stories high, and situated on the line of the N. Y., N. H. & H. R. R. A line of new styles is in preparation by this company and will be put on the market under trademark red D.

alternate use of both is the greatest profit.

The first method is that of the artistic and harmonious, the blending together of colors and shades, the goods simply taking the place of decorative paraphernalia.

The second method consists of the display of goods, not really inartistically arranged, and yet with more or less of a sacrifice of harmony and art—the presentation of the goods themselves more than the arrangement of them.

No artist would be particularly impressed, from an artistic standpoint, with a large packing box in a window

with the name of the firm written thereupon in the shipping clerk's style of lettering, with a single Hammer or a piece of a Tire or an Electric Bell, or any other one thing, on the top of the box, conspicuous by its isolation, and yet such a window display would, from its novelty, attract the attention of every passerby.

English and American Business Methods.

BY VIATOR.

FREQUENT intercourse and transactions with merchants and manufacturers in England and the United States have brought to our

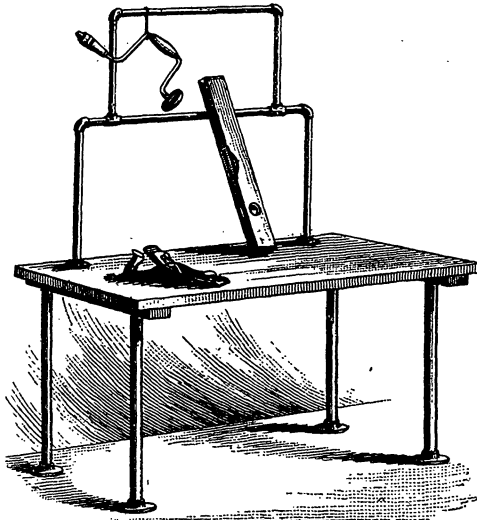



Fig. 2—Display Stand.

A window display should never be a conglomeration of articles, unless such articles are used in the production of an artistic effect.

Working exhibits are always profitable.

There isn't anything very original or very brilliant in placing a wagon in a



SCOFIELD & CO.
GUN CARD.

MAKE _____

NO. _____

CALIBER _____

BARREL _____

LENGTH _____

COST, _____

SELL _____

Fig. 3.—Gun Tag.

window and arranging it so that the wheels are kept in motion, and yet the movement of the wheels will make every one stop, and if they stop to see the wheels go around they cannot help admiring the finish and construction of the vehicle.

notice the methods pursued by both in transacting business.

In the first place, the greater portion of English houses have been established for generations and thus are largely guided by light derived from experience. They possess a conservative force which tends to keep them from traversing unknown and uncertain regions. In the United States, business houses who now do 75 per cent. of the business of the land have sprung into being within a score of years.

Selling Below Cost.

Whether an Englishman is a manufacturer or dealer, he will insist upon making a profit, not only in a general way, but he will have a profit on each and every article he produces or deals in. He has reached the conclusion that he must have a profit.

An American embarks in the manufacturing business, say Table Cutlery. He invests his money in plant and machinery, and when he gets ready to market his product, surveys the market and the methods of his opponents. He finds that a Knife which costs \$4 per gross to produce is sold at \$3.50 per gross. He at once resolves that he must meet competition and makes his price \$3.50 per gross, or 50 cents per gross under the cost of production, but hopes to make up the loss sustained on some other pattern which his competitor is not making. But very frequently it comes to pass that the customer only happens to need the Knife upon which there is a loss and refuses to buy the profitable pattern and thus make up the loss.

There can be no question that this method is not sound business. It is a

tendency in the wrong direction. It is a breeder of uncertainties and of demoralization.

Unreasonable Profits.

An Englishman will not put an extravagant profit upon any article



SCOFIELD & CO.
STOVE CARD.

NAME _____

NO. _____

COST, _____

STOVE ONLY, \$ _____

WITH FURNITURE, \$ _____

NO. POS. FURNITURE _____


SIZE OF OVEN _____

SIZE OF FIREBOX _____

WEIGHT _____

Fig. 4—Stove Tag.

which he produces, as it invites imitations and competition. For the purpose of our explanation, suppose a useful article is invented, patented and placed upon the market at, say, 100 per cent profit. The alert competitor finds it. He estimates its cost and finds



SCOFIELD & CO.
PRICE CARD.

ARTICLE _____

COST _____

SELL _____

Fig. 5.—Price Tag.

it yields 100 per cent. profit. He at once sets to work to get up an article intended for the same purpose, places it on the market at, say, 25 per cent. profit, and he takes the field. Had the original inventor been contented with a profit of 25 per cent. he would not have invited competition and might have enjoyed the fruits of his brains for the life of the patent.

Changes in Prices.

There is a decided contrast between the English and American methods in

selling goods. In England the prices are made at home office, by the firm. In America they are largely made by commercial tourists, on the road.

We could name lines of goods by the hundred, such as Peter Wright's Anvils, Ward & Payne's Sheep Shears, Stubbs' Files, Rodgers' Cutlery, on which prices have not deviated on an average of 5 per cent. in ten years. We have in mind an American article which was placed upon the market within ten years, at \$3 per dozen, and now it sells at 38 cents per dozen, or a decline of \$2.62 per dozen. This shows that the first price made was out of all reason, hence it invited unusual competition; then the drummer got at it and did the rest.

It will interest the average Hardware dealer to take up a price-list of English goods, published, say, in 1892, and compare it with one published in 1894. Then take up American price-lists covering the same periods, and note the difference.

It is a lack of backbone of American manufacturers and merchants which has brought about the present unsatisfactory condition of the Hardware business.

The declines which have been the result of a lack of nerve to uphold prices have wiped out all profits.

Keeping Cutlery and Plated Ware Bright

A CORRESPONDENT writes suggesting that the placing of gum camphor in a showcase containing bright steel Tools and Cutlery will prevent them from rusting. There is some value in the suggestion, as it has been found desirable to keep camphor in the case with such goods, as it appears to absorb properties of the atmosphere which are injurious to bright steel surfaces. Camphor is, however, much more useful in preventing Plated Ware from oxidizing or discoloring, and is kept in showcases with Plated Knives, Forks, Spoons, Plated Hollow Ware, &c., by many Hardware merchants. In connection with this class of goods it is well to bear in mind that rubber bands are injurious to Plated Ware, as are also rubber handled goods, neither of which should ever be put in a case with Plated Ware. The sulphur in the rubber discolors Silver Plated Ware. Rubber bands are not found desirable for holding Ivory Handled Pocket Cutlery on boxes, as the rubber imparts to the ivory a dull dark color; nor are they used at all for sampling in one of the largest Cutlery establishments in the country, but when it is necessary to attach samples to boxes it is done with twine. For preventing rust from accumulating on bright steel goods in cases calcium chloride, which can be obtained at almost any drug store, is the most effective. This has an affinity for moisture and absorbs it rapidly. An approved method of using calcium chloride was described and illustrated in *The Iron Age* October 13, 1892.

Price-Lists, Circulars, &c.

GILLETTE CLIPPING MACHINE COMPANY, 201 East Twenty-third street, New York: Horse Clippers. An illustrated circular and price-list shows a variety of Horse Clipping Machines and Clipper Plates. The Clippers are arranged to run by hand, steam or electric power. Attention is directed to their Feather Weight Clipper packed in a case for carrying from place to place.

THE CHALLENGE CORN PLANTER COMPANY, Grand Haven, Mich.: Challenge Iceberg Refrigerators. The company, whose New York office and salesroom is at 106 Chambers street, issue a handsomely bound and well arranged illustrated catalogue of 86 pages devoted to these goods. In addition to the goods already known to the trade, the catalogue shows new styles of Refrigerators for use in apartment houses; restaurants, grocers or florists; by butchers on counters; in nurseries; and also new patterns of Sideboard Refrigerators. The company state that at all times they carry in advance from two to three years' stock of thoroughly seasoned lumber, in order to make goods that will last.

SARGENT & Co., New York and New Haven: Eclipse Door Check and Spring. An illustrated pamphlet is devoted to Checks, Springs and Combined Check and Spring. Illustrations show the various methods of fastening these goods to the door or casing, for right or left hand doors, and for circular top doors. The Eclipse Dumb waiter Check is also shown.

ST. LOUIS ART METAL COMPANY, 2225 DeKalb street, St. Louis, Mo., and 280 Broadway, New York: Metallic Office and Vault Furniture for public buildings, banks, safe deposit and trust companies, &c. Circulars illustrate Vault Cars and Omnibuses, Roller Shelves with metallic curtain, Metallic Telescoping Case, File Boxes, File Cases, &c.

JOSEPH H. SEED, 21-23 Centre street, New York: Patented Specialties. An illustrated price-list shows Water Filters, Self Lighting Gas Burners, Paper Bag Holder, Gas Stove, Gas Tip Cleaner, Pocket Cook Stove, Automatic Knife, Pocket Oilier, Anti-electric Automatic Alarm Bell, Can Opener, Family Soldering Set, Detachable Spout and Can Opener, Coat, Hat and Bag Hanger, Pants Hanger, Tea and Coffee Strainer, Scissors Sharpener, Pickle Grabber, &c.

THE SHIRK REFRIGERATOR COMPANY, 254 East Madison street, Chicago: The Shirk Refrigerators. A catalogue and price-list of these goods illustrates Refrigerators, Sideboard Refrigerators and Ice Boxes for use in households, for grocers, hotels, restaurants, &c. Several special designs are shown of Refrigerators built in private residences. The Refrigerators are cork filled, and the manufacturers call attention to the points of excellence embodied in these goods as follows: The circulating system, insulation, traps, ease of cleaning, purity of food chamber, and workmanship.

THE WISCONSIN REFRIGERATOR COMPANY, Eau Claire, Wis.: Wisconsin Peerless hardwood dry air Refrigerators. An illustrated catalogue and price-list shows a line of Refrigerators and Ice Chests for households, grocers, hotels and butchers; also Sectional Refrigerators, Sideboard Refrigerators, &c. Among the special features of these goods is mineral wool used for filling, seven walls to preserve ice, cleansable flue system and automatic lever clamp locks.

JEWELL BELTING COMPANY, Hartford, Conn.: Leather Belting, &c. The company issue a catalogue relating to the transmission of power by Leather Belting which gives records, tests and tables. The catalogue also contains illustrations of their factory, Belting, Lacing, Belt Hooks, &c., and calls particular attention to their Jewell Extra, Jewell Diamond and Jewell Dynamo brands of Belt.

WESTERN AUTOGRAPHIC REGISTER COMPANY, 927-929 North Eleventh street, St. Louis, Mo.: Autographic Registers. The Registers are described as being a complete check system for the business man, making as it does duplicate or triplicate bills at one writing. An illustrated pamphlet and price-list illustrates and describes the Registers.

COLUMBUS SEWER PIPE COMPANY, Columbus, Ohio: Vitrified salt glazed Sewer Pipe, &c.: The catalogue is devoted to illustrations and prices of Sewer Pipe, Flue Pipe, Flue Lining, Chimney Tops, Fire Clay, Well Tubing, Drain Tile, Fire Brick, Cement, &c.

F. E. MYERS & BROTHER, Ashland, Ohio: Pumps and Hay Tools. A pamphlet devoted to Pumps illustrates, with descriptions and prices, branch pipe single acting Force Pumps, with windmill head and three way cock, for tubular wells; Imperial anti-freezing windmill Force Pump; Ashland Force Stand for tubular or other wells; double acting branch pipe Pump; windmill regulator Force Pump; seamless drawn brass and brass lined Cylinders.

KRAEUTER & Co., Newark, N. J.: Ticket Punches. In an illustrated catalogue and price-list a large variety of styles of Punches are shown. Following the page upon which each Punch is illustrated, with description and prices, are the figures or designs made by the Punch. Each design is numbered to facilitate ordering such designs as are wanted.

H. F. DERNELL & Co., Athens, N. Y.: Ice Tools. An illustrated catalogue is devoted to prices and descriptions of Ice Plows, Snow Ice Planes, Saws, Bars, Chisels, Hooks, Tongs, Grapples, Scrapers, Skids, Chip Sleigh, &c. It is stated that Ice Tools have been made since the year 1854 by or under the personal inspection of H. F. Darnell, and that the company have the facilities and ample resources for manufacturing these goods, which their experience enables them to produce at low prices.

THE STANDARD LIGHTING COMPANY, Cleveland, Ohio: New Process Vapor Stoves. The company's 1895 catalogue shows a line of New Process Vapor Stoves, Globe Incandescent Lamps, Oil Heaters, Torches, &c. Illustrations also show in detail the Burner Drum and valve used on their 1895 Stoves.

SARGENT & Co., New York and New Haven, Conn.: Hardware Supplies. A catalogue of 64 pages illustrates Can Openers, Sausage Stuffers, Tobacco Cutters, Meat Cutters, Meat Hooks, Kitchen and Butcher Saws, Shoe and Butcher Knives, Spring Balances, Scales, Faucets, Cork Screws, Bird Cage Hooks, Hammers, Match Safes, Boot Jacks, Tacks, Tinned and Enamelled Ware, Sad Irons, Mincing Knives, Wringers, Mouse and Rat Traps, Thermometers, Coffee Mills, Curry Combs, &c. A discount sheet accompanies the catalogue.

C. W. DUNLAP & Co., 88 Chambers street, New York: Housekeeping Hardware, Garden Tools, &c. A budget of circular cards illustrates Mincing Knives, Family Cleavers, Cake Turners, Oyster Knives, &c.

BROAD GAUGE IRON STALL WORKS, Frank O. Worthley, proprietor, 53 Elm street, Boston: Stable Fixtures. A miniature catalogue illustrates, with prices, Mangers, Iron Clad Stall Floor, Stall Guards, Harness Brackets. Manure Scuttle, Hinges for Round Posts, Wagon Jacks, Mortise Spring Stall Latch, Clock Work Grain Feeders, Overhead Safety Hitch, Vanes, Posts, &c. A price list with enlarged type will be mailed free to any address by the proprietor.

It Is Reported—

California.

That Mudgett & Nicholls, NATIONAL CITY, have removed their Hardware store to new quarters.

Connecticut.

That the clerks employed in the Hardware stores of HARTFORD have formed an organization, the object of which is to improve social acquaintance.

Illinois.

That Charles Hobbs and Edward Schweigert have bought out the Stove and Hardware business of Weisenberger & Mosbach, at LA SALLE.

That C. E. Snell, Hardware, Stoves, &c., has removed to larger quarters, at VANDALIA.

That Watson & Grosnitz, Hardware merchants, SPRINGFIELD, have removed to larger and more commodious quarters at 421 Monroe street.

Indiana.

That C. M. Bonham & Co., FOWLER, have sold their Hardware store to A. M. Warrick of Sheldon, Ill., who is now in charge.

That the Hardware store of Bishop & Pearson, SHELBYVILLE, was entered by thieves on the morning of the 30th ult., and \$75 worth of goods stolen.

That the Bonvall Hardware & Implement Company have been organized at BONVALL. The capital stock is \$50,000.

Iowa.

That the Foster - Bailey - Goodrich Company, GRINNELL, have opened a new Hardware store.

That the Hardware store of Martindale & West, HENDERSON, was burglarized on the 17th ult., and \$75 worth of Revolvers and Silver Ware stolen.

That there is an opening for a Hardware store at POPEJOY.

That W. J. Bradley, AURORA, has sold his Hardware stock to E. C. Shepard.

That a new Hardware store is being erected at MADRID by Mr. Hatfield.

Kansas.

That O. M. Brill of LOUISVILLE has purchased a Hardware store at NORTH TOPEKA.

Kentucky.

That M. P. Gray, Hardware merchant, of FRANKFORT, has sold his stock to Geo. L. Hannen.

Michigan.

That Emery Billman, NORTH QUINCY, has sold his stock of Hardware and buildings to Herbert Bohner.

Minnesota.

That Janney Bros.' Hardware establishment, at MINNEAPOLIS, was robbed of \$300 worth of goods on November 30. The stolen goods consisted of Revolvers, Pocket Knives, Razors, &c. The robbery was an unusually bold and daring one. A wagon was used to carry off the stolen goods.

That C. L. Boudrye of GRANADA has sold his stock of Hardware to Messrs. Field & Boston of Sanford, Iowa. They have also purchased J. Cooper's stock of Tinware, and will consolidate the two stocks at GRANADA.

That Sorenson & Bailey have just opened a store at WHEATON, under the name of Enterprise Hardware Company. They will carry a stock of Hardware, Stoves, Tinware, Cutlery,

Guns, Ammunition, &c., and will also manufacture tin, copper and sheet iron ware.

Nebraska.

That Fred. Roos is the proprietor of a new Hardware store at DUNBAR.

That G. R. Dill has moved his stock of Hardware into his new building at BELVIDERE.

Missouri.

That the Hardware store of M. F. Foster, at ARMOURDALE, was robbed on the 29th ult.

That John Glenn of KINGSTON has purchased C. A. Gilliland's Hardware store.

That H. E. Hosman has sold his Hardware store at LOCK SPRINGS and is looking for another location.

That C. R. Brown has succeeded Brown & Channell, Hardware dealers at WEATHERBY.

New York.

That Hanson & Decker, stove dealers and tinsmiths, GLOVERSVILLE, have disposed of their business to Miller & Russell of Blossburg, Pa.

North Carolina.

That the Slover Hardware Company, at NEW BERNE, have been incorporated by George Slover, Lycurgus H. Cutler and Jesse C. Watkins. The capital stock is \$80,000.

Ohio.

That an amendment to the articles of incorporation of the Hoyt & Boebinger Hardware Company, CINCINNATI, has been obtained, changing the style to the Boebinger Hardware Company.

That V. D. Latimer of ASHTABULA is moving his Hardware stock to his new store.

Pennsylvania.

That A. O. Wolf of WILLIAMSTOWN is thinking of entering the Hardware business at TOWER CITY.

That a change in the management of the Pickett Hardware Company, WARREN, has taken place by which H. A. Jamieson becomes chairman; E. T. Howes, for many years with the Oil Well Supply Company, treasurer, and H. G. Stillwell, also of the Oil Well Supply Company, manager.

That the limited copartnership of the Barlow, Brigham & Pollett Company, Hardware merchants of CORRY has been dissolved. The company will be reorganized with increased capital, the purpose being to extend their wholesale business.

That Kies, Eimer & Co., GALETON, are building a new Hardware store.

Texas.

That B. H. Johnson of FROST is the successor of Johnson & Scott in the Hardware business at CORSICANA.

That Venner & Wilmarth's Hardware store, at FORNEY, was burglarized on the 30th ult.

That August Finn's Hardware store, at AUSTIN, was recently destroyed by fire. It was insured for \$3500.

Vermont.

That John A. Manson & Co., BURLINGTON, have opened a new Hardware store. The store is 85 feet in depth, with a frontage of 21 feet and a width at the rear of 25 feet. The store is 13 feet from floor to ceiling, and is finished in butternut and maple, with paneled ceilings. Mr. Manson has had eight years' experience as traveling salesman and is thoroughly familiar with the Hardware business. E. H. Prouty will be head clerk of the new firm.

Washington.

That Cohn & Cohn, Hardware merchants, SEATTLE, have dissolved and disposed of their stock.

Wisconsin.

That George Loesher is intending to open a new Hardware store at MENASHA about January 1.

That A. H. Sheldon & Co., Hardware dealers, JANESVILLE, will soon remove to a new location in that city.

The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—The movement during the past week has been almost wholly in prices, and that on the downward scale. In other words, it is a case of unsettled market with hardly the average volume of business. On quick process domestic dry White Lead quotations as low as $3\frac{3}{4}$ ¢ have been made openly, and 4¢ has not been an uncommon rate for old Dutch process Lead, in round lots. Rumor has it that the latter was sold at a shade under the prices quoted, and that desirable orders would yet be filled at about $3\frac{3}{8}$ ¢. Competition between sellers of Lead in Oil has been very keen. Home producers have met the lowest rates named by sellers of foreign brands, and in some instances took particularly desirable orders at about $5\frac{1}{4}$ ¢ for next year's delivery. This was against foreign competition. German brands for future shipment are offered at the equivalent of $5\frac{1}{4}$ ¢ laid down here, and ordinary English at as low as $5\frac{1}{2}$ ¢, in lots of 25 tons or more. Purchases of round lots have been moderate, however, and the market is quite as dull as it is weak. As for mixed Leads, they are offered at prices to suit circumstances and find slow sale. The National Lead Company has issued a revised price-list, quoting $5\frac{1}{4}$ ¢ for lots of 500 lb or more; $5\frac{3}{4}$ ¢ for lots of less than 500 lb, in kegs, with usual difference for small packages. To buyers of 12 tons during the coming year a rebate of $\frac{1}{4}$ ¢ per pound will be allowed.

Red Lead and Litharge.—A new list has been issued for Paint trade quality, quoting kegs, in lots of less than 500 lb, at $5\frac{3}{4}$ ¢; in larger quantities at $5\frac{1}{4}$ ¢, with half barrels and quarter barrels at $\frac{1}{4}$ ¢ less, all subject to a rebate of $\frac{1}{4}$ ¢ on purchases of 12 tons during the year. This brings official quotations down to the level of prices at which foreign brands have been selling on net cash terms, but the cheapening of cost has not stimulated business perceptibly. Low grade Litharge, used chiefly in the glass and rubber industries, is quoted at $4\frac{1}{4}$ ¢ @ $4\frac{1}{2}$ ¢, near future delivery.

Orange Mineral.—Foreign brands are quoted at about the same prices that have ruled for some little time past, but the quotations are nominal in a great measure. Special rates are made on both French and German product where desirable orders may be involved and the market has a rather weak appearance. Domestic is more or less unfavorably affected, as far as price is concerned, and meets with slow sale.

Zincs.—Low prices that have been secretly made of late are now openly quoted by most American manufacturers of Oxide, but the removal of the mask has not served to stimulate business. Lead is too cheap for a healthy market. Ordinary domestic Zinc may be secured in round lots at $3\frac{1}{4}$ ¢ for delivery the coming year. Small lots and special brands are quoted at about the usual premium. Foreign brands are without radical change in price, but the market is weak and only small quantities are bringing full list rates. German product, in large packages,

could probably be secured at 4¢, laid down here, but the general quotation is $\frac{1}{4}$ ¢ @ $\frac{3}{8}$ ¢ above that.

Colors, &c.—There have been no changes of importance in prices for leading varieties of dry Colors, and the market has shown the dullness that is usually experienced at this season of the year. If anything, the leaning of prices is more or less in buyers' favor. Oil Colors and Mixed Paints have met with slow sale, there having been little done except in some specialties for delivery early next year. Prices are uneven and irregular, but have undergone no radical change the past week.

Oils and Turpentine.

Linseed Oil.—City crushers hold their prices at the basis of 56¢ for raw Oil, with usual allowance for package. Some out-of-town brands have been put in at 1¢ @ 2¢ less, but not to a sufficient extent to have any decidedly unfavorable bearing upon the market. Outside of routine business there is nothing doing at the moment, and buyers generally are going slow, since the market has no unusually strong features at the present time.

Cotton Seed Oils.—Considerable business has been done during the week, chiefly for home account, but the prices were almost invariably low, and a warrantable presumption is that excessive supplies is the dominating influence. Sales have been made of prime quality Crude at 24¢ @ 24½¢, prime summer yellow at 29¢ @ 30¢, and other grades at corresponding prices. Surface appearances are that the market suffers from the weight of excessive supplies.

Lard Oil.—Business has been on ordinary lines and merely fair, all told. This has served to offset whatever natural influence there may have been in the best features of the market for raw material, and 54¢ @ 55¢ stand as top prices for best city brands. Western has been sold and may yet be secured at some concession from the prices quoted by city crushers. Several brands have been put through at 53¢ @ 54¢ during the past few days.

Fish Oils.—It is reported that several thousand barrels of crude Menhaden Oil have been sold at or a shade under 20¢ for average quality, nearly if not quite all of which went to local pressers. No change has taken place in prices for pressed and bleached products. Sperm and Whale Oils remain very quiet, with prices standing much the same as they were a week ago. Cod Oil is unchanged in price and selling rather slowly.

Spirits Turpentine.—Very little change in prices has taken place during the week under review. Business has been of routine sort also, and there is really nothing new in the situation that buyers or sellers can turn to advantage. Late business has been mostly at 27½¢ @ 28¢, as to style of package.

The Buckeye Stable Pail.

The Buckeye Churn Company, Sidney, Ohio, are putting on the market a stable pail, the body of which is made of $\frac{1}{4}$ -inch selected oak. The hoops are $\frac{1}{8}$ inch wide, three of them encircling the body of the pail. The bail, of $\frac{1}{4}$ inch round iron, is secured to the pail by hame clips, each of these being fastened by two strong rivets. The special features of the pail are referred to by the makers as being its great strength, and the construction of the bottom, which is made flush so that it cannot be forced out by the foot of an animal. It is explained that the pails are nested one dozen in a crate; that they are neatly finished, and that they are sold at a very low price.

Brass Pumps.

The cuts here shown represent pumps recently put on the market by the Goulds Mfg. Company, Seneca Falls, N. Y. Fig. 1 represents a plumbers' brass force pump, having a 1-inch cylinder and 16-

first stories, the pump will be fully appreciated; also that the pump is small and compact and that but little space is required for its accommodation. The cylinder is $1\frac{1}{8}$ inches in diameter, with a stroke of $3\frac{1}{2}$ inches. The manufacturers state that they can fit both the suction

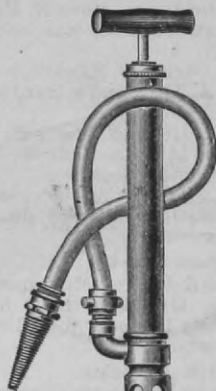


Fig. 1.—Plumbers' Brass Force Pump.

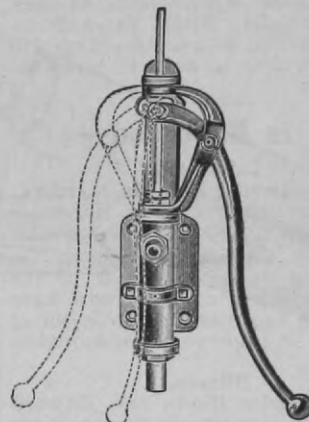


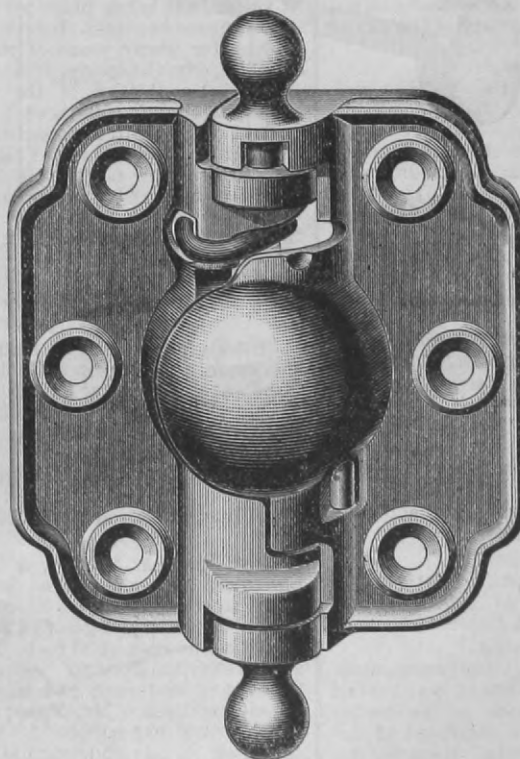
Fig. 2.—Brass Lift and Force Pump.

inch stroke. The pump is furnished with 3 feet of hose and a conical tip, so that it may readily be connected to any ordinary sized pipe. The pump is designed for removing obstructions in waste or water pipes, and for this purpose the pump is placed in a vessel of water and the pipe to be cleaned is connected to the pump by the hose. It is stated that the pump is compact and that it may easily be carried in a sack of plumbers' tools. A brass lift and force pump is shown in Fig. 2, on an iron frame with a revolving lever, which

and discharge for either hose or wrought iron pipe, if so ordered, but that the suction is regularly fitted for 1-inch lead pipe and the discharge for $\frac{3}{4}$ -inch lead pipe.

Globe Surface Spring Hinge.

Sargent & Co., 33-37 Chambers street, New York, are offering a hold-back surface spring hinge for screen doors, of which the accompanying cut is full size. Back of the globe or sphere in the center of the hinge is a



Globe Surface Spring Hinge.

can be moved at will to any desired position most convenient to operate the pump. The point is made that the change of the position of the lever involves no removal of nuts and bolts, and that it is as easily effected as the pump is to operate. It is remarked that where the head of water works is not sufficient to force the water above the

stout coppered steel coil spring, placed horizontally. There are four turns to it and one end is fastened at the lower right hand side, as shown, while the other end is connected with the left side of the hinge by a steel link at the top. The goods are japanned, attractive in appearance, and are put up both with and without screws.

The Lefever New Automatic Ejector Gun.

The Lefever Arms Company, Syracuse, N. Y., are putting on the market a new and improved ejector gun, as

mers lift, in cocking, the rear end of the lever is forced down. When the hammers reach the cock notch the hook B is released, forcing the front end of the lever A, which is in contact with the lever in the lug, thus forcing out the extractor and shells. It is stated

struction of the movement is such that it does not in any way weaken the mechanism of the gun or interfere with any of its compensating features. The company state that the ejector parts can be removed by any one without a possibility of a mistake in replacing them; that there are no extra movements to make; that there is no increased force required in manipulating the gun, and that the gun is handled in the same manner as one of the company's guns without an ejector. The point is made that every piece in the gun is milled to gauge, and that in case of breakage it can be readily duplicated by mail. The company remark that in this gun they have overcome the two great objections made to ejector guns in general by constructing a mechanism which is not complicated and liable to get out of order, and by offering the gun at a medium price.



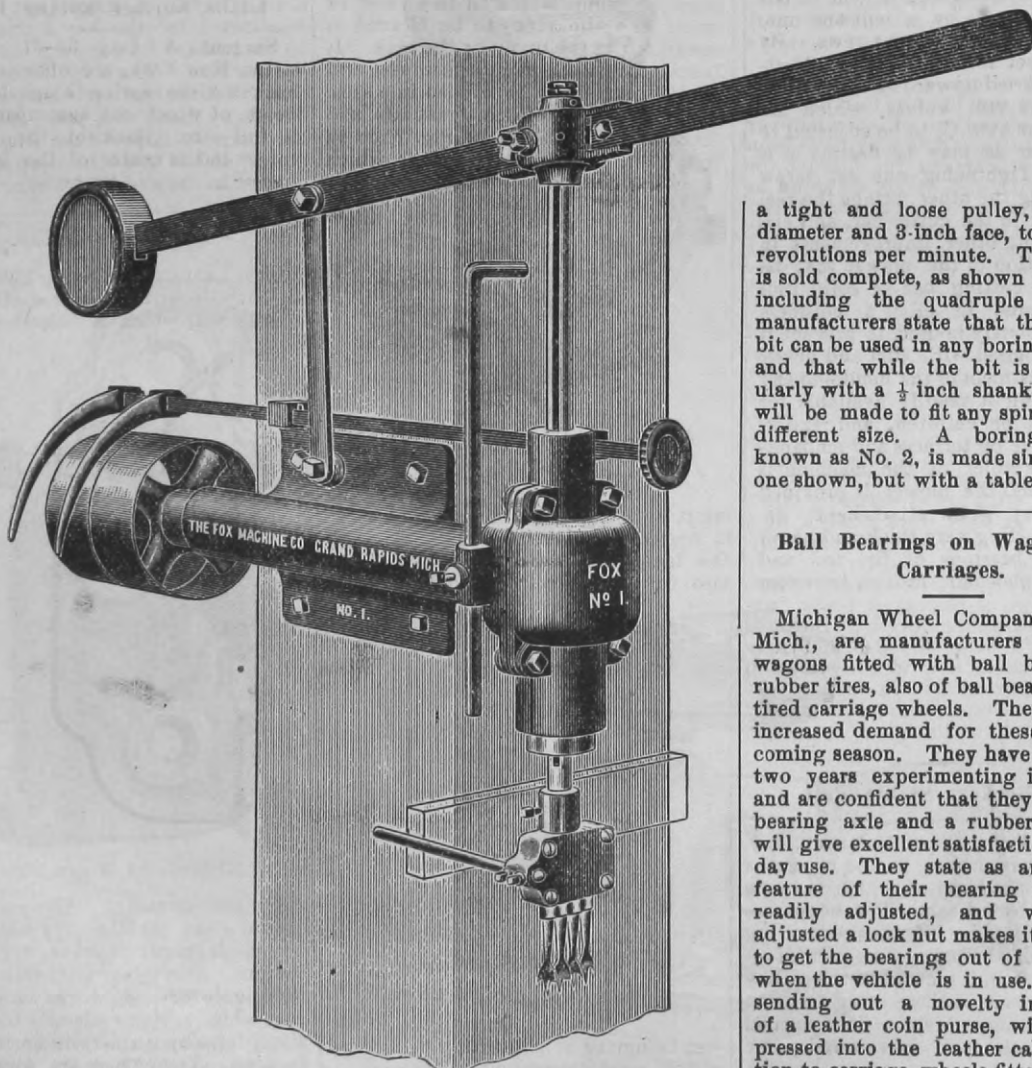
The Lefever New Automatic Ejector Gun.

shown in the accompanying cut. In the illustration A represents a lever pivoted in the frame with projections on the front end and a notch on the rear end, actuated by the upper arm of

that only the discharged shell is ejected and that it is thrown with force a good distance; also that the hammers always cock before the shell is ejected. The ejector movement consists of only two

Post Boring Machine No. 1.

The accompanying cut represents a post boring machine offered by the Fox Machine Company, Grand Rapids, Mich. The machine is designed to fasten to a post, which may be done by the use of four $\frac{1}{2}$ x 4 inch coach screws, in a position ready to belt up. The machine is provided with



Post Boring Machine No. 1.

the main spring. B represents a hook pivoted in the hammers, which is always in contact with the notch in the end of the lever, so that when the ham-

pieces—the hook pivoted in the hammer and the lever pivoted in the frame—and the manufacturers call attention to the fact that the simplicity of the con-

a tight and loose pulley, 7 inches in diameter and 3-inch face, to make 600 revolutions per minute. The machine is sold complete, as shown in the cut, including the quadruple bit. The manufacturers state that the four-hole bit can be used in any boring machine, and that while the bit is made regularly with a $\frac{1}{2}$ inch shank, the shank will be made to fit any spindle, if of a different size. A boring machine, known as No. 2, is made similar to the one shown, but with a table.

Ball Bearings on Wagons and Carriages.

Michigan Wheel Company, Lansing, Mich., are manufacturers of trotting wagons fitted with ball bearings and rubber tires, also of ball bearing rubber tired carriage wheels. They expect an increased demand for these goods the coming season. They have been about two years experimenting in this line, and are confident that they have a ball bearing axle and a rubber tire which will give excellent satisfaction for every day use. They state as an important feature of their bearing that it is readily adjusted, and when once adjusted a lock nut makes it impossible to get the bearings out of adjustment when the vehicle is in use. They are sending out a novelty in the form of a leather coin purse, with lettering pressed into the leather calling attention to carriage wheels fitted with ball bearings and rubber tires, as manufactured by them. The purse is flat and circular in form, consisting of two parts, one inside the other; the inner part revolving so as to bring the opening in it convenient for putting in or taking out coins.

F. & N. Mower Micrometer Adjustment.

Among the improvements introduced by the F. & N. Mfg. Company, Richmond, Ind., for whom the C. F. Guyon Company, 97-99 Reade street, New York, are agents, in their 1895 line of lawn mowers, an illustration of one of their machines being given in Fig. 1, is a micrometer adjustment, as shown in Fig. 2. This illustration presents a view of the inside of one of the frame

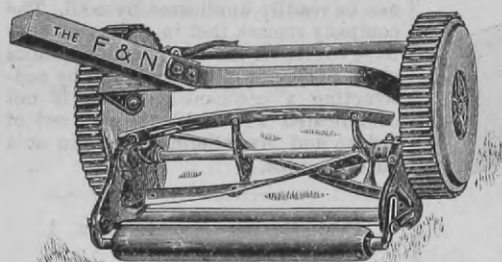


Fig. 1.—Improved F. & N. Lawn Mower.

end pieces, on the other side of which is the driving wheel. In the illustration a portion of the adjusting box is cut away to show the action of the set screws A A against the lug B, which is cast with and is a part of the frame end. The adjusting box is held in position on the frame by a bolt and nut, at the end opposite the set screws. By moving the set screws A A the adjusting box is carried upward or downward, enabling the reel knives, which are carried on the axle C, to be adjusted to the cutter bar as may be desired or is necessary. Tightening one set screw and loosening the other brings the reel knives closer to the cutter bar, and *vice versa*. Among other improvements in the construction of the mower may be mentioned a cutting bar of solid tool steel, tempered in oil; a noiseless ratchet completely housed to prevent it becoming clogged with dirt and grass, and the adjustment of the handle to any height, making it readily available for use by ladies or children, and rendering it effective on terraces and embankments. The roller of the machine is adjustable, and the mower is provided with a heavy grass attachment, designed for cutting very thick and heavy grass. The bearings of the reel and shaft are of phosphor bronze, to render

The New King of the Road Lamp.

The cuts here shown represent the improved King of the Road bicycle lamp for 1895, manufactured by Joseph Lucas & Son, Birmingham, Eng., for

can be unscrewed from the top piece. It is explained that the lens serves the double purpose of improving the light and of keeping the reflector clean; so that instead of having to polish the metal reflector, the lens is simply wiped over. The opening half of the

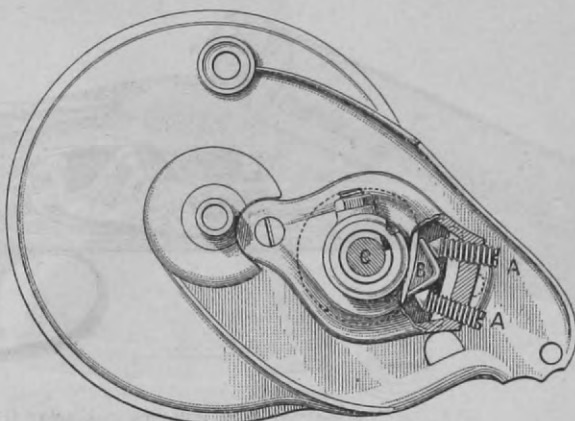


Fig. 2.—The Micrometer Adjustment.

whom John H. Graham & Co., 113 Chambers street, New York, are agents. Fig. 1 shows the exterior appearance of

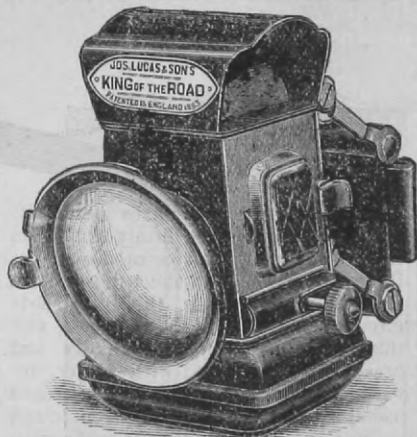


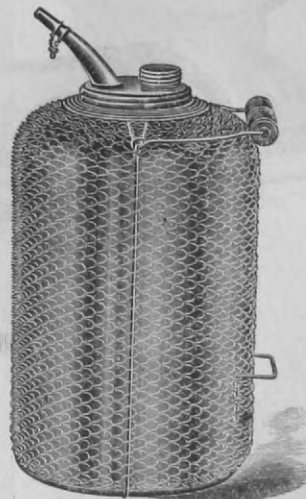
Fig. 1.—The New King of the Road Lamp.

lamp, and Fig. 2 the manner in which it opens for cleaning. Two sides of the lamp open, and the top, which also carries the reflector and is shown

lamp may be detached for cleaning by withdrawing the hinge pin. The oil tank has been enlarged, and may be filled through a brass tube located on the outside of the lamp behind the fixed side. The burner is removed by giving it a half turn. A thumb nut has been substituted for the key formerly used on the bracket for securing the lamp to the machine. The manufacturers state that this is the best cycle lamp ever produced by them, and that their object has been to improve the illuminating power, and to make the lamp more convenient to use and keep clean.

Kerosene Oil Can.

Ohio Lantern Company, Tiffin, Ohio, are manufacturing a novel oil can, as here shown, which is intended princi-



Glass Oil Can with Woven Wire Cushion.

pally for kerosene. The body is of crystal glass, enabling the user to determine instantly the quantity of oil in the can. The glass is covered with a tight wire netting, woven around the can, which projects about $\frac{1}{4}$ inch on all sides, forming an admirable protective cushion. There is a tin disk on the bottom, joined to the wire work, and an iron rod on each side running vertically, to which the bail is fastened. The top, spout, nozzle, &c., are of tin. The cans have a capacity of 1 gallon. W. W. Pryor & Co., 81 Chambers street, New York are the Eastern agents and carry the goods in stock.

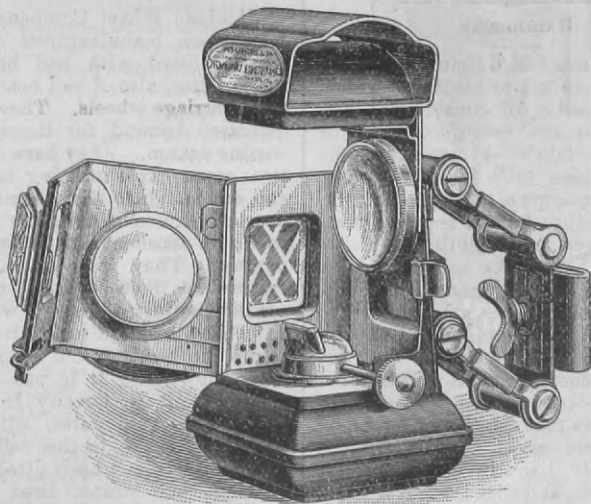


Fig. 2.—Lamp Open for Cleaning.

the machine durable and light running. The makers state that the machines are sent out with an absolute guarantee, and that they are handsomely finished.

but partly raised in Fig. 2, can be pulled entirely out. The reflector is now covered with a double convex lens with a nickel screw mount, so that it

L. & G. Improved Milk Can Stock.

The accompanying illustrations show the improved L. & G. patented milk can stock, for shipping purposes, just placed on the market by the Lalance & Gros-

coated and re-coated with pure block tin. The interior is consequently perfectly smooth, instead of having the three soldered seams found in the older styles—a great recommendation, it is remarked, in point of easy cleansing.

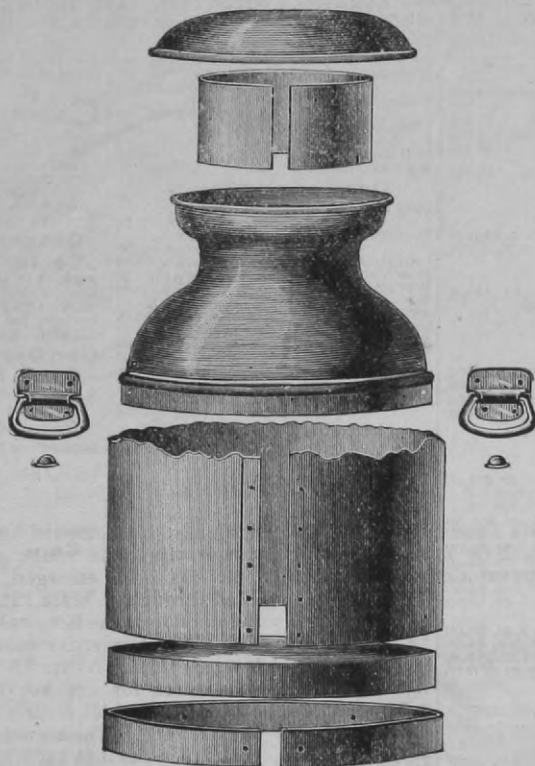


Fig. 1.—L. & G. Improved Milk Can Stock.

jean Mfg. Company, 19 Cliff street, New York. The style here shown represents the pattern of can in use in New York State, but the articles are also



Fig. 2.—Milk Can Made from L. & G. Improved Stock.

made in all the leading sizes and patterns adopted in other parts of the country, some 20 different styles being manufactured. The particular feature of this stock, which has been secured by a recent patent, is the fact that the bowl, neck and breast, and also the neck and breast only, are made in one seamless piece of heavy steel, thickly

Further, to protect the cans in transit, a strong iron hoop is firmly tinned on the breast rims. It is pointed out that the cylinder, or body sheet, has a close bearing of $1\frac{1}{4}$ inches, the full inside circumference of the can breast, and this space, between the cylinder and breast rim, is floated with solder, obviating the weakness and subsequent leakage which has so often been found to be the fault of milk cans made with other than the straight form of breast rims. There are, as will be seen in Fig. 1, three thicknesses of metal solidly united as one by two additional layers of pure block tin and solder, with the stiff iron hoop on the outside, at the point where strength and durability are most essential.

Hammocks.

I. E. Palmer, Middletown, Conn., has recently added to his Arrowwanna Mills an extension of considerable size to be used for the manufacture of his well-known fabric hammocks. The product of these mills includes canopy fixtures and canopies, mosquito netting, crinoline linings, Palmer's patent window screen and piano cloth and Palmer's patent hammocks and suspension devices. The Palmer patent hammocks, which are more or less well known to the hardware trade, are one of the principal features of the business. They are highly ornamented, and as well adapted to indoor as outdoor use. The manufacturer states that the theory on which they are made gives greater strength and durability than can be obtained by other methods, and that the novelty and comfort of the pillow and spreader cannot but be appreciated. All these hammocks are tested with the weight of two persons, and many different styles are made with a great variety of colors and various patented devices calculated to make the hammocks hang gracefully

and make them generally far more comfortable and salable than the old fashioned bag hammocks.

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Current Hardware Prices.

DECEMBER 12, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

Adjusters, Blind—

Domestic, $\frac{1}{2}$ doz. \$3.00.....33 $\frac{1}{2}$ ¢@33 $\frac{1}{2}$ ¢&10%
Excelstor, $\frac{1}{2}$ doz. \$10.00.....50¢@10%
North's.....list net @ 10%
Zimmerman's—See Fasteners, Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—
Eagle Anvil, $\frac{1}{2}$ doz. \$15.00.....15¢@15¢&5%
Horseshoe brand, Wrought.....9¢@10¢
Barnes Mfg. Co.....50%

Imported—

Armitage's Mouse Hole.....8¢@9¢
S. & H. Machine finished.....9¢@10¢
Trenton.....9¢@9¢
Peter Wright's.....9¢@10¢

Anvil, Vise and Drill—

Allen Anvil and Vise, \$3.00.....40¢@10%
Cheney Anvil and Vise.....25%
Millers Falls Co., \$18.00.....20%
Holt's.....40¢@40¢&10%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Common Augers and Bits, 70¢@10¢&5%
Boring Machine Augers.....70¢@10¢&5%
Car Bits, 12-in. twist.....50¢@50¢&10%
Cincinnati Bell-Hangers' Bits.....40%
Forstner Pat. Auger Bits.....25%
Jennings' Pattern Car Bits.....40¢@40¢&10%
Jennings' Pattern Auger Bits, 60¢@60¢&10%
C. E. Jennings & Co., No. 10 extension
lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, $\frac{1}{2}$ set
32 $\frac{1}{2}$ quarters, No. 3, \$5.00, 30, \$3.50, 25%
Russell Jennings' Augers and Bits, 25¢@10%
Lewis' Patent Single twist.....45%
L'Hommedieu Car Bits.....15¢@10%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
Snell's Bits.....60¢@10¢&50¢&5%

Bit Stock Drills—

Cleveland.....50¢@10¢&5%
Morse Twist Drills.....60¢@5%
New Process Twist Drill Co.
Standard.....40¢@10%
Syracuse, for metal.....50¢@50¢&10%
Cincinnati, for wood.....40¢@40¢&10%
Cincinnati, for metal.....50¢@50¢&10%
Syracuse, for wood (wood list) 30¢@10¢&40%

Expansive Bits—

Clark's small, \$18; large, \$36. 40¢@40¢&5%
Ives' No. 4, $\frac{1}{2}$ doz. \$80. 40¢@40¢&10%
Steer's No. 1, \$26; No. 2, 18. 40¢@40¢&5%
Stearns' No. 2, \$48. 20%
Swan's.....40¢@40¢&10%

Gimlet Bits—

Bee.....25¢@25¢&10%
Common, $\frac{1}{2}$ doz. \$2.50.....40¢@10%
Diamond, $\frac{1}{2}$ doz. \$1.25.....40¢@10%
Double Cut:
Hartwell's, $\frac{1}{2}$ gr. \$10.00.....40¢@10%
Douglass'.....40¢@10¢&50%
Ives'.....60¢@10¢&60¢&10%
Shepardson's.....45¢@10¢&45¢&5%

Hollow Augers—

Bonney's Adjustable..... $\frac{1}{2}$ doz. \$21.00
Cincinnati Adjustable.....25¢@10%
Cincinnati Standard.....25¢@10%
Douglass'.....33¢@33¢&10%
French, Swift & Co. (Beecher).....33¢@33¢&10%
Ives'.....33¢@33¢&10%
Ives' Expansive, each, \$4.50.....50¢@5%
Stearns'.....20¢@10%
Universal Expansive, each \$4.50.....20%
Wood's, $\frac{1}{2}$ doz. \$48. 25¢@10%

Ship Augers and Bits—

L'Hommedieu's.....15¢@10¢&15¢&5%
Snell's.....25¢@25¢&10%
Snell's Ship Auger Pat'n Car Bits
15¢@10¢&15¢&5%
Watrous'.....25¢@25¢&10%

Awl Hafts—See Hafts, Awl.

Awls—

Brad, Handled..... $\frac{1}{2}$ gr. \$2.50@3.00
Brad, Shouldered..... $\frac{1}{2}$ gr. \$1.30@1.40
Peg, Pat..... $\frac{1}{2}$ gr. 35¢@35¢
Peg, Should..... $\frac{1}{2}$ gr. \$1.50@1.55
Scratch, Handled..... $\frac{1}{2}$ gr. \$4.00@4.00
Scratch, Socket..... $\frac{1}{2}$ doz. \$1.10@1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands.....\$5.50@6.00
First quality, other brands.....\$5.00@5.50
Beveled, add 50¢ per doz.

Axle Grease—See Grease, Axle.

Axles—

No. 1 Common.....3¢
No. 2 Common.....3¢
Nos. 7 to 14.....70%
Nos. 15 to 18.....47%
Nos. 16 to 22.....70%
Concord, loose collar.....44¢
Concord, solid collar.....49¢

Bag Holders—See Holders, Bag.

Balances—

Sash—
Caldwell, low list.....30%
Pullman.....80%
Sensible.....60%

Spring—

Spring Balances.....40¢@10¢&50%
No. 2000 20 30
Chatillon, $\frac{1}{2}$ doz. \$0.80 .05 1.75 net
Chatillon Straight Balances.....40¢@40¢&10%
Chatillon Circular Balances.....50¢@10%

Barb Wire—See Wire, Barb.

Bars—

Crow—

Cast Steel..... $\frac{1}{2}$ doz. 23¢@3¢
Iron, Steel Points..... $\frac{1}{2}$ doz. 24¢@24¢

Basins, Wash—

Standard Fiberware, No. 1, 10 $\frac{1}{2}$ in., \$1.80;
12-inch, \$2.00; 13 $\frac{1}{2}$ -inch, \$2.50.

Beams, Scale—

Scale Beams, List Jan. 12, '82.....50¢@10¢&50¢&10%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50¢@10¢&50¢&10%
Custers', doz. lots.....33%

Beaters—

Egg—

Bryant's..... $\frac{1}{2}$ gr. \$14.00
Double (H. & R. Mfg. Co.), $\frac{1}{2}$ gr. No. 1,
\$12.00; No. 1, \$15.00; No. 2, \$36.00.
Dover..... $\frac{1}{2}$ doz. \$1.00; $\frac{1}{2}$ gr. \$10.50
Dover, Ex. Family size..... $\frac{1}{2}$ doz. \$3.50
Dover (Standard Co.)..... $\frac{1}{2}$ doz. \$1.00
Duplex (Standard Co.)..... $\frac{1}{2}$ doz. \$1.00
Duplex Extra Heavy (Standard Co.)
 $\frac{1}{2}$ doz. \$3.50
Easy (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gr. 12.00
Improved Acme (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gr. \$9.00
Silver & Co..... $\frac{1}{2}$ doz. \$4.50
Spiral..... $\frac{1}{2}$ gr. \$4.25@4.50
Triple (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gr. \$16.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%

Bells—

Cow—

Common Wrought.....60¢@10%
Kentucky Durham.....70¢@10%
Kentucky, Sargent's list.....70¢@10%
Kentucky "Star".....20¢@10%
Texas Star.....50¢@10¢&60%
Western, Sargent's list.....70¢@10%

Door—

Crank, Brooks'.....50¢@10¢&2%
Crank, Cone's.....20¢@10%
Crank, Connel's.....20¢@10%
Gong, Abbe's.....33¢@10%
Gong, Barton's.....40¢@10¢&50%
Gong, Yankee.....45¢@10%
Lever, R. & E. Mfg. Co.'s.....50¢@10¢&2%
Lever, Sargent's.....60¢@10%
Lever, Taylor's Bronzed or Plated.....25¢@10%
Pull, Brooks'.....60¢@10¢&2%

Electric—

Bigelow & Dowse.....20¢@20¢&10%
Wollensak's.....20¢@20¢&10%

Hand—

Extra Heavy Brass.....70%
Light Brass.....70¢@10¢&70¢&10%
Silver Chime.....33¢@10%
White.....25¢@10%
Globe (Cone's Patent).....25¢@10¢&35%

Miscellaneous—

Call.....50%
Farm Bells..... $\frac{1}{2}$ doz. 24¢
Steel Alloy Church and School Bells.....50%

Bellows—

Blacksmiths'.....70¢@70¢&5%
Hand Bellows.....50¢@10¢&50¢&10%
Molders'.....50¢@10¢&50¢&10%

Belting, Rubber—

Common Standard.....75¢@10¢&75¢&10%
Extra.....60¢@10¢&60¢&10%
Standard.....70¢@10¢&75%
N. Y. B. & P. Co., Carbon.....60¢@10¢&5%
N. Y. B. & P. Co., Double Diamond.....60%
N. Y. B. & P. Co., 1846 Para.....40¢@10%

Bench Stops—See Stops, Bench.

Benders and Upsetters, Tire—

Brettell Tire Upsetter, \$15.....45%
Detroit Perfected Tire Bender.....15¢@15¢&10%
Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....15%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.,
see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron.....50¢@10¢&60¢&10%
Moore's Novelty, Mal. Iron.....60¢@10¢&50%
Sure Grip Steel Tackle Blocks, 25¢@25¢&10%
See also Machines, Hoisting.

Boils—

Carriage, Machine, &c.—
Com., list June 10, '84.....80¢@25%

Genuine Eagle, Norway, list Oct. '84.....80¢@50¢&80¢&10%

Eagle, Norway, list Oct. '84.....80¢@10¢&80¢&15%

Phila. pattern, list Oct. 7, '84.....70%

R. B. & W., old list.....80¢@25%

Roll Ends, list Jan. 1, '90.....80¢@25%

Machine, list Jan. 1, '90.....80¢@25%

Door and Shutter—

Cast Iron Barrel, Square, &c.....75¢@10¢&75¢&10¢&5%

Cast Iron Chain (Sargent's list).....65¢@10¢&65¢&10¢&5%

Cast Iron Shutter Bolts 75¢@10¢&75¢&10¢&5%

Ives' Patent Door, 60¢@10¢&60¢&10¢&10%

Wrought Barrel.....75¢@10¢&80%

Wrt B. K. Flush Comm. 60¢@10¢&60¢&10¢&10%

Wrt Shutter, Brass Knob.....50¢@10¢&60%

Wrt Shutter, Sargent's list.....66¢@70%

Wrt Shutter, all Iron, Stanley's list.....66¢@70%

Wrought Square.....75¢@10¢&80%

Wrt Sunk Flush, Sargent's list.....60¢@10%

Wrt Sunk Flush, Stanley's list.....60¢@60¢&10%

Stove and Plow—

Plow.....80¢@10¢&80¢&10¢&10%

Stove.....70¢@70¢&5%

R. B. & W. Plow.....55%

Tire—

Common, list Feb. 28, '83.....70¢@10%

American Sewing Machine.....70¢@10%

Norway Phila., list Oct. 16, '84.....75¢@10%

Eagle, Phila., list Oct. 16, '84.....80¢@10%

Bay State, list Feb. 28, '83.....70¢@10%

Franklin Moore Co.....70¢@10%

Norway Phila., list Oct. 16, '84.....75¢@10%

Eagle, Phila., list Oct. 16, '84.....80¢@10%

Eclipse, list Feb. 28, '83.....70¢@10%

Port Chester Bolt & Nut Company.....70¢@10%

Empire, list Feb. 28, '83.....70¢@10%

Keystone, Phila., list Oct. '84.....80¢@10%

Norway Phila., list Oct. '84.....75¢@10%

R. B. & W., Phila., list Oct. 16, '84.....85%

Borers, Tap—

Common and Ring.....20¢@10%

Clark's.....33¢@35%

Enterprise Mfg. Co.....25%

Ives' Tap Borers.....33¢@35%

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Letter—

Tatum's.....40%

Boxes, Wagon—

Per m.....24¢

Boxes, Miter—

Spilker's Excelstor, 3-in., \$7.50; 4-in.,
\$8.50; 5-in., \$13.00; 6-in., \$15.00.....20%

Braces—

NOTE.—Most Braces are sold at net prices.

Barber's.....50¢@10%

Armstrong's.....50¢@5%

Common Ball, American.....\$1.00@1.10

Davis Patent.....50¢@10%

Fray's Genuine Spofford's.....50¢@10¢&5%

Fray's Nos. 70 to 120, 81 to 123, 207 to
414.....50¢@10¢&5%

Ives' New Haven Novelty.....70¢@70¢&5%

New Haven Ratchet.....60¢@10¢&10%

Barber Ratchet.....60¢@10¢&10%

Barber's.....60¢@5%

Spofford.....60¢@5¢&60¢@10%

P. S. & W. Co., Peck's Patent.....60%

Rose & Johnson.....50%

Brackets—

Shelf, fancy:
Sargent's list.....70¢@70¢&10%

Other makes at a wide range of prices.

Shelf, plain:

Regular list.....65¢@70%

Sargent's list.....60¢@10¢&70¢&10%

Bradley Shelf Brackets.....75%

Bright Wire Goods—See Wire.

Broilers—

Hens' Self- $\frac{1}{2}$ Inch.....0 10 9x11

Basting, $\frac{1}{2}$ Per doz. \$4.50 5.50 6.50

Morgan Odorless, $\frac{1}{2}$ doz., \$12.....50%

Wire Goods Co.....65¢@10%

Buckets, Well and Fire—

See Pails.

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers, Butchers'.

Butts—Brass—

Cast Brass, Fast.....33¢@10%

Cast Brass, Loose Joint.....33¢@10%

Cast Brass, Tiebout's.....50%

Wrought Brass.....80¢@10¢&80¢&20%

Cast Iron—

Fast Joint, Broad.....60¢@10¢&60¢&10¢&10%

Fast Joint, Narrow.....60¢@60¢&10%

Loose Joint.....

Loose Joint, Japanned.....

Loose Joint, Jap. with Acorns.....

Loose Pin, Acorns.....75¢@10%

Loose Pin, Acorns, Japanned.....@80%

Loose Pin, Acorns, Japanned.....

Mayer's Hinges.....

Parliament Butts.....

Wrought Steel

Chisels—**Socket Framing and Firmer**

Mix	
Onto Tool Co.	75¢10@80¢
P. S. & W.	
Witherby	
Buck Bros.	30%
Charles Buck	30%
Douglas	75¢75@10¢
Merrill	60¢10@60¢10¢5¢
L. & J. White	30¢30@5¢
Tanged and Miscellaneous	
Buck Bros.	30%
Charles Buck	30%
Butchers'	\$4.75@5.00 to 2
Spear & Jackson's	\$5 to 2
Tanged Firmers	50¢50@10¢
L. & J. White, Tanged	25¢5¢
Cold Chisels, fair quality	\$14@10¢

Chucks—

Beach Pat.	each \$8.00	20%
Danbury	each \$8.00	30¢30@5¢
Graham Patent		33%
Morse's Adjustable	each \$7.00	20¢20@5¢
Syracuse, Balz Pat.		25%
Skinner Patent Chucks		
Combination Lathe Chucks		40%
Drill Chucks		40%
Independent Lathe Chucks		40%
Planer Chucks		20%
Universal Lathe Chucks		40%
Union Mfg. Co.		
Combination		40%
Independent		40%
Universal		40%
Victor	\$8.50	25%

Churns—

McDermaid Star Barrel Churn	each 6-gal.	\$2.60	10-gal.	\$2.75	15-gal.	\$3.00	20-gal.	\$3.25
Tiffin Union	each	5-gal.	\$3.25	7-gal.	\$3.75	10-gal.	\$4.25	

Clamps—

Adjustable Cincinnati		25¢10¢
Adjustable, Hammers		15¢15@5¢
Adjustable, Stearns'		30¢30@10¢
Barnes' Malleable Screw and Cabinet		50%
Barnes' Machines' Clamps		33%
Cabinet, Sargent's		70¢10¢
Carpenters', Cincinnati		25¢10¢
Carriage Makers', P. S. & W. Co.		40¢10¢
Carriage Makers', Sargent's		75¢75@5¢
Eberhard Mfg. Co.		40¢50@40¢5¢
Joiners' Clamps		25¢10¢
R. I. Tool Co.'s Wrought Iron		25%
Saw Clamps, see Vises, Saw Firms'		
Stearns' Malleable, with Wrought Iron		75¢75@5¢
Stearns' Steel		25%
Warners'		40¢10¢40¢10¢5¢

Cleavers, Butchers'

Beatty's		40¢50@10¢
Bradley's		25¢30%
Foster Bros.		30%
New Haven Edge Tool Co.'s		40%
Nichols Bros.		30%
P. S. & W.		33¢45¢@33¢45¢
Schulte, Lohoff & Co.		40¢10¢5¢
L. & J. White		25%

Clips—

Baker Axle Clips		25¢10¢
Norway Axle		70¢70@5¢
Norway Spring Bar Clips		60¢10¢10¢70¢
2d grade Norway Axle		70¢70@10¢
Steel Felloe Clips		\$14 to 4¢44¢
Superior Axle Clips		70¢70@10¢
Wrought Iron Felloe Clips		\$14 to 4¢44¢

Cloth and Netting, Wire

See Wire, &c.

Cockeyes

Cocks, Brass—

Hardware List (Globe, Kerosene, Lever

Bibbs, Racking, &c.) 60¢10¢10¢2¢

Coffee Mills—See Mills, Coffee.

Collars, Dog—

Brass, Pope & Stevens' list		40%
Chapman Mfg. Company, new list		40%
Embossed Gift, Pope & Stevens' list		50%
Leather, Pope & Stevens' list		40%
Medford Faye Goods Co.		40¢10¢50%

Combs, Curry—

American Curry Comb Co.		33¢40¢
Fitch's		50¢10¢50¢10¢5¢
Gibbs' Magnetic		\$1 doz. \$2.00
Kohler's Humane		\$1 doz. \$1.75
Kohler's Magic Oscillating		\$1 doz. \$2.00
Rubber, \$ doz. \$7.50		20%

Compasses, Dividers, &c.

Compasses, Callipers, Dividers, 70¢10¢75¢		
Bemis & Call Co.'s		
Dividers		55%
Callipers, Call. Patent Inside		65%
Callipers, Double		65%
Callipers, Inside or outside		65%
Callipers, Wing		60%
Compasses		50¢5¢
Excelsior		60%
Starrett's		
Combination Dividers		25%
Lock Callipers and Dividers		25%
Spring Callipers and Dividers		25¢10¢
Stevens & Co.'s		25¢10¢

Coolers Water—

S. S. & Co. 2-gal. \$3.40; 3-gal. \$4.00;

4-gal. \$4.50; 6-gal. \$5.60 each. 60%

Coopers' Tools—

See Tools, Coopers'.

Cord—

Braided, Crown Drab and Fancy		\$1 doz. \$5.00
Braided, Crown White		\$1 doz. \$5.00
Cable Laid Italian Sash		\$1 doz. \$19.00
Common		\$1 doz. \$8.00
Common Russia Sash		\$1 doz. \$12.00
Egyptian, India Hemp, Braided		\$1 doz. \$13.00
India Cable Laid Sash		\$1 doz. \$11.00
Massachusetts, White		\$1 doz. \$12.00
Ossawaun Falls		
Crown, Solid Braided White		\$1 doz. \$22.00
Crown, Drab and Fancy		\$1 doz. \$22.00
Braided Giant, Drab and Fancy		\$1 doz. \$30.00
Braided, Giant, White		\$1 doz. \$20.00
Patent, good quality		\$1 doz. \$10.00
Patent Russia Sash		\$1 doz. \$13.00
Samson		
Braided, Drab Cotton		\$1 doz. \$42.00
Braided, India Hemp		\$1 doz. \$40.00
Braided, Linen		\$1 doz. \$56.00
Braided, White Cotton		\$1 doz. \$37.00
Semper Idem, Braided, White		\$1 doz. \$26.00
Silver Lake		
A quality, Drab, 50¢		25%
A quality, White, 50¢		10%
B quality, Drab, 30¢		10%
B quality, White, 30¢		10%
Sylvan Spring, Extra Braided, Drab		30%
Sylvan Spring, Extra Braided White		34%

Tate's Solid Braided :

Economy, Drab		\$1 doz. \$27.00
Economy, White		\$1 doz. \$22.00
Hercules, Drab		\$1 doz. \$30.00
Hercules, White		\$1 doz. \$25.00
White Cotton Braided, fair		\$1 doz. \$23.00

Wire Pictures

Braided or Twisted 50¢10¢80¢20%

Corkscrews—See Screws, Cork.**Corn Knives and Cutters**

See Knives, Corn.

Crackers, Nut—

Acme		
Japanned, gr. \$30		50%
Nickel Plated, gr. \$30		30%
Fancy Nickel Plated, gr. \$30		40%
Table (H. & B. Mfg. Co.)		50%
Turner & Seymour Mfg. Co.		50%

Cradles—

Grain 50¢2¢50¢5¢2¢

Crayons—

White Crayons, gr. gross		60¢6¢
Cases, 100 gr. \$3.75 @ 4.25, at factory		
D. M. Stewart Mfg. Co.		
Metal Workers', gr. \$2.50		20¢25%
Railroad, gr. \$2.00		20¢25%
Rolling Mill, gr. \$2.50		20¢25%
Soapstone Pencils, gr. 1.50		20¢25%
Sales Chalk		

Creamery Pails—See Pails, Creamery.**Crow Bars—See Bars, Crow.****Curr Combs—**

See Combs, Curry.

Cutters—Meat—

American		
Nos. 1 2 3 4 5		30%
Each	\$5 \$7 \$10 \$25 \$50 \$80	
Enterprise		25%
Nos. 10 12 22 32		25%
Each	\$3 \$2.50 \$4 \$6 \$15	
Dixon's, doz.		40¢40¢5¢
Nos. 1 2 3 4 5		
Each	\$14.00 \$17.00 \$19.00 \$30.00	
Draw Cut, each		
Nos. 5 7 8 9		20¢25%
Hale's, doz.		70¢70¢5¢
Nos. 11 12 13		
Each	\$27.00 \$33.00 \$45.00	
Home No. 1, doz.		55¢10¢
Little Giant, doz.		40¢10¢50%
Nos. 305 310 312 320 322		25%
Each	\$25.00 \$45.00 \$44.00 \$72.00 \$85.00	
Miles' Challenge, doz.		45¢45¢10¢
Nos. 1 2 3 4 5		
Each	\$22.00 \$30.00 \$40.00	
Triumph No. 505, doz.		\$21.00 25¢30%
Woodruff's, doz.		40¢40¢5¢
Nos. 100 150 155		
Each	\$15.00 \$18.00	
Chadborn's Smoked Beef Cutter, doz.		\$60.00
Enterprise Beef Shavers		20%

Slaw and Kraut—

Tucker & Dorsey Mfg. Co.

Kraut Cutters, 1 K. 1 doz. \$40.00

Slaw Cutters, 2 Knife, gr. \$30.00

Slaw Cutters, 2 Knife, gr. \$30.00

Tobacco

Acme, doz. \$20.00 40%

All Iron 40%

Champion 20¢20¢10¢

Nassau Lock Co.'s, doz. \$18.00 50¢5¢

National, doz. \$21.00 30%

Sargent's, doz. \$24.00 60¢60¢10¢

Wash

Appleton's, doz. \$16.00

Bonneys', doz. \$8.50 60¢10¢60¢10¢10¢

Cincinnati 25¢10%

Johnson's, Wm., doz. \$11.00 50%

Penny's, doz. \$14.00 50%

Smith's Pat., doz. \$12.00 20¢10¢10¢

Sum's 25¢10%

Diggers, Post Hole, &c.—

Eureka Diggers, doz. \$11.00

Fletcher Post Hole Augers, doz. \$36.00

Gem, Improved, doz. \$8.50 90¢

Gibbs' Columbia, doz. \$12.00

Gibbs' Imperial, doz. \$10.00

Gibbs' National, doz. \$12.00

Gibbs' Post Hole Digger, doz. \$17.00

Kohler's Hercules, doz. \$10.00

Kohler's Invincible, doz. \$10.00

Kohler's Little Giant, doz. \$15.00

Kohler's Champion, doz. \$7.50

Kohler's Pioneer, doz. \$9.00

Ryan's, doz. \$18.00

Sampson, doz. \$34.00 25¢25¢10¢

Universal, doz. \$15.00

Shimer's Hollow Handle, doz. \$24.00 50%

Vaughan's Post Hole Auger, doz. \$8.50 90¢50%

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Checks—**

See Checks, Door.

Door Springs—

See Springs, Door.

Drawers, Money—

Money Drawers, doz. \$18.00 \$20.00

Morford, doz. \$18.00 \$20.00

Waddell's Improved, No. 1, doz. \$15.00

Waddell's Improved, No. 2, doz. \$18.00

Waddell's Comb, Cutlery Case and Alarm Till. \$12.50

Drawing Knives—

See Knives, Drawing.

Drills and Drill Stocks—

Automatic Boring Tools. \$1.75@1.85

Bench Drills, Stearns' 50%

Blacksmiths' each \$1.75

Blacksmiths' Self-feeding each \$7.50 30%

Breast, Bartholomew, No. 12, doz. \$16.00

Breast, Millers Falls, each \$3.00 25%

Breast, P. S. & W. 40¢10%

Breast, Wilson's 30¢5%

Chicopee Automatic Drill 20¢10%

Goodell Automatic Drills 40¢50@40¢10%

Hatch, Curtis & Curtis 35%

Ratchet, Ingersoll's 25%

Ratchet, Merrill's 20¢20¢5%

Ratchet, Moore's Triple Action 25¢30%

Ratchet, Parker's 20¢20¢5%

Ratchet, Weston's 20¢25%

Ratchet, Whitney's 20¢10%

Whitney's Hand Drill, Plain, \$11.00

Adjustable, \$12.00 20¢10%

Twist Drills—

Cleveland 50¢10¢

Diamond, W. & B. 50¢00

Graham's Pat. Groove Shank. 5¢

Morse 5¢

New Process

Standard 50¢10¢5¢

Syracuse (Metal list) 60¢5¢

Drill Bits or Bit Stock

Drills—See Augers and Bits.

Drill Chucks—See Chucks.**Dripping Pans—**

See Pans, Dripping.

Drivers, Screw—

Allard's Spiral 50%

Brace Screw Drivers 25¢10%

Buck Bros. 30%

Buck Bros. Screw Driver Bits 27¢45¢

Clark's Pat. 33¢40¢

Cincinnati 25¢10%

Champion 25¢10%

Disston's 50¢00¢10%

Dixie Spine Co. 20¢20¢10%

Ellrich's Socket and Ratchet 40¢10%

Fray's Hol. H'dle Sets, No. 3, \$12.00, 45%

Gay & Parsons 35%

Goodell's Automatic 50¢50¢5¢

Hawthorn-Allard 50%

Knapp & Cowles 40%

No. 1 70¢10%

No. 2 70¢10%

No. 3 60¢10%

Nos. 4 and 00, Acme and Ideal 60¢10%

Kolb's Common Sense, doz. \$6.00 25¢10%

Mayhew's Black Handle 50%

Mayhew's Monarch 45¢10%

New York, Manhattan and Handy 20%

P. S. & W. 70%

Sargent & Co.'s 60¢10¢10%

No. 1 Forged Blade 60¢10¢10%

Nos. 20, 40 and 60 60¢10¢10%

Screw Driver Bits, Parr's, gr. \$8.25

Screw Driver Bits, doz. 50¢75¢

Stanley's R. & L

sewing, Pat., Long 1 doz. \$1.20
sewing, Pat., Short 1 doz. 45¢ 50¢

Halters—

Covert's Adj. Rope Halters 40¢ 25¢
Covert's Adj. Web Halters 35¢ 25¢
Covert's Hemp Horse and Cattle 50¢ 10¢ 25¢
Covert's Jute Cattle Ties 70¢ 10¢ 25¢
Covert's Jute Horse Ties 70¢ 25¢
Covert's Rope, 7-16 in. Jute 70¢ 25¢
Covert's Rope, 1/2 in. Hemp 35¢ 25¢
Covert's Rope, Jute 60¢ 10¢ 10¢ 25¢
Covert's Saddlery Works Halters 33¢ 10¢
Covert's Saddlery Works Handy Web Halters 33¢ 10¢ 25¢
Covert's Saddlery Works Horse and Cattle Ties 33¢ 10¢ 25¢

Hammers—**Handled Hammers—**

Atha Tool Co. 50¢ 10¢ 60¢
Humason & Beckley 50¢ 10¢ 60¢
Verree 40¢ 10¢
Cheney's Claw 40¢ 10¢
Cheney's Machinists' & Riveting 50¢ 5¢
C. Hammond & Son 40¢ 10¢ 50¢
Magnetic Tack, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Heavy Hammers and Sledges—

3 lb and under 40¢
3 to 5 lb 75¢ 10¢ 80¢
Over 5 lb 10¢ 10¢ 80¢
Wilkinson's Smiths' 10¢ 10¢ 80¢

Handcuffs and Leg Irons—

See Police Goods.

Handles—**Cross-Cut Saw Handles—**

Atkins 40¢
Champion 45¢ 45¢ 10¢
Ely's Perfection 40¢ 45¢ 10¢
Sensible, 1/2 doz. Pr. \$5.00 60¢

Iron, Wrought or Cast—

Barn Door, 1/2 doz. \$1.40 20¢ 5¢
Bronze Iron Drop Latches 40¢ 60¢
Chest, Sargent's list. 50¢ 10¢ 60¢ 10¢ 10¢
Door or Thumb: Nos. 0 1 2 3 4
Per doz. \$0.90 1.00 1.08 1.15 1.50
60¢ 10¢ 10¢ 70¢

Jap'd Store Door Handles—Nuts, \$1.62; Plate, \$1.10; no plate, \$0.88 10¢**Boggin's Latches 20¢ 28¢ 30¢****Wood—**

Auger, assorted, 1/2 gr. \$5.00 50¢
Auger, large, 1/2 gr. 7.00 50¢
File, assorted, 1/2 gr. 2.75 50¢
Brad Axl 20¢
Apple Firmer, 1/2 gr. 5.00 50¢
Apple Firmer Chisel, large, 1/2 gr. 5.00 50¢
Hickory Firmer Chisel, ass'd, 1/2 gr. 4.50 50¢
Hickory Firmer Chisel, large, 1/2 gr. 5.00 50¢
Socket Firmer Chisel, ass'd, 1/2 gr. 3.00 50¢
Socket Framing Chisel, ass'd, 1/2 gr. 5.00 50¢
Chisel, Fibre Head 33¢
Hammer, Hatchet, Axe, &c. 40¢ 10¢ 10¢
Hoe, Rake, Shovel, &c. 60¢ 10¢
Pat. Auger, Douglass 1/2 set \$1.25
Pat. Auger, Ives 30¢ 10¢
Pat. Auger, Swann's 1/2 set \$1.00
Saw and Plane 40¢ 10¢ 50¢

Hangers—

Barn Door, New England 70¢ 70¢ 5¢
Barn Door, old patterns 70¢ 70¢ 5¢
Barry 50¢
Best Anti-Friction 60¢ 10¢ 60¢ 10¢ 5¢
Boss 60¢ 10¢ 60¢ 10¢ 5¢
Champion 60¢ 10¢
Chicago Anti-Friction 60¢ 10¢
Climax Anti-Friction 55¢ 5¢ 5¢
Crescent 60¢ 10¢
Cronk's Patent, Steel Covered 60¢ 10¢
Duplex (Wood Track) 60¢ 10¢ 5¢
Economy 50¢ 10¢
Hamilton Wrought Steel Track 55¢
Interstate 60¢ 10¢
Kidder's 50¢ 10¢
Lane's Parlor 40¢ 10¢
Lane's Standard 60¢ 10¢ 10¢ 25¢
Lane's Covered 60¢ 10¢ 10¢
Lundy Steel Parlor 40¢
Magic 50¢ 50¢ 5¢
Matchless 60¢ 10¢ 5¢
Moody 45¢
Moore's Luggage Car Door 33¢ 10¢
Moore's Elevator 33¢ 10¢
Moore's Railroad 55¢
Nickel, Steel, Nos. 0, \$25; 1, \$20; 2, \$15 40¢ 10¢ 50¢

Orleans Steel 55¢

Paragon, No. 1, \$3.50; No. 2, \$4.50; No. 3, \$5.50 per doz. 50¢
Paragon Parlor 1/2 set \$2.00
Pendulum, Payson's 40¢ 40¢ 10¢
Perfection 50¢ 10¢ 50¢ 10¢ 5¢
Richards 30¢ 30¢ 10¢
Samson Steel Anti-Friction 55¢
Star 40¢ 10¢ 40¢ 10¢ 5¢
Stearns' Anti-Friction 20¢ 10¢ 10¢
Stearns' Challenge 25¢ 50¢ 10¢
Sterling 50¢ 10¢ 60¢
Terry's Ideal 50¢ 10¢ 50¢ 10¢ 5¢
Terry's Modern 50¢ 10¢ 50¢ 10¢ 5¢
Terry's Shield 50¢ 10¢ 60¢
Terry's Solid 50¢ 10¢ 60¢
Terry's Wrought Single Strap 50¢ 10¢
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00 50¢ 2¢
Warner's Pat. 20¢ 10¢ 10¢
Wild West 50¢ 50¢ 5¢
Zenith for Wood Track 55¢

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.: Blood's 40 & 10
Hunt's 50
Hurd's 50
Mann's 50
Underhill's 50
C. Hammond & Son 50
Fayette R. Plumb 10
Collins 10
Kelly's 10
P. S. & W. Co. 50 & 50
Sargent & Co. 10
Schulte, Lohr & Co. 10
Ten Eyck Edge Tool Co. 10

Hay and Straw Knives—

See Knives.

Hinges—**Blind Hinges—**

Clark's: Nos. 1, 3, 5, 1868, Old Pattern 75¢ 10¢ 5¢
Nos. 1 and 3, Tip Pattern 75¢ 10¢ 5¢
No. 50, Buffalo Noiseless, 40, 60 and 75 75¢
Buffalo Reversible, Nos. 3, 2, 1, 1/2, 1 and 0 70¢ 5¢
No. 1, Cottage, for wood only 80¢ 10¢
No. 1, Diamond, for wood only 80¢ 5¢
Dixie L. & P., Nos. 3, 2, 1, 1/2, 1, 0, 0, 4 and 5 75¢ 5¢
No. 25, Empire Reversible 75¢ 10¢
Lull & Porter, Nos. 3, 2, 1, 1/2, 1, 0, 0, 4 and 5 75¢ 10¢ 25¢
Mortise Gravity, Nos. 2, 4, 4, 1/2, 6, 8 and 10 50¢
Huffer 50¢ 50¢ 10¢
Parker 75¢ 10¢
North Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50 10¢
Reading's Gravity 75¢ 10¢ 75¢ 10¢ 5¢
Sargent's, Nos. 1, 3, 5, 11, 12, 13 75¢ 10¢ 75¢ 10¢ 5¢
Shepard's: Acme, Lull & Porter, Nos. 3, 2, 1, 1/2, 1, 0, 0, 4 and 5 75¢ 5¢
Buffalo Gravity Locking, Nos. 1, 3 and 5 80¢ 5¢
Champion Gravity Locking, No. 75 80¢ 10¢
1868, Old Pat'n, Nos. 1, 3 & 5-75 and 100 Tip Pattern, Nos. 1, 3 and 5-75 and 100 Double Locking, Nos. 20 and 25-70 and 50 Empire, Nos. 101 and 103 75¢ 5¢
Niagara Gravity Locking, Nos. 1, 3 and 5 80¢ 5¢
Noiseless, Nos. 50, 60, 65 and 55 80¢ 5¢
O. S. Lull & Porter, Nos. 3, 2, 1, 1/2, 1, 0, 0, 4 and 5 75¢ 10¢ 25¢
Pioneer, Nos. 680, 45 and 5 75¢
Steamboat Gravity Locking, No. 10 80¢ 10¢

Gate Hinges—

Automatic, 1/2 doz. \$12.50 50¢
Clark's, Nos. 1, 2, 3 60¢ 10¢ 60¢ 10¢ 5¢
N. E. 1/2 doz. \$7.80 60¢ 10¢ 10¢
N. E. Reversible, 1/2 doz. \$5.60 60¢ 10¢
N. Y. State, 1/2 doz. \$4.90 60¢ 10¢
Shepard's, Nos. 1, 2, 3 60¢ 10¢ 60¢ 10¢ 5¢
Western, 1/2 doz. \$4.20 60¢ 10¢ 60¢ 10¢ 5¢

Spring Hinges—

Acme 30¢
American 20¢
Bardsley's Patent Checking 15¢
Barker's Double Acting 25¢
Bommer's Japanned 35¢
Bommer's All other Kinds 35¢
Champion 60¢
Chicago 30¢
Columbia 1/2 gr. \$10.00 20¢
Crown 20¢
Devore, No. 1 1/2 gr. \$13.00 20¢
Freeport 1/2 gr. \$12.00 20¢
Geer's Spring and Bias Butt 40¢
Gem 20¢
Ideal No. 3 1/2 gr. \$8.00 20¢
J. G. C. Covered, 1/2 gr. \$30 85¢
Knoxall 1/2 gr. \$12 20¢
New Idea No. 1 1/2 gr. \$10.00 20¢
New Idea No. 2 1/2 gr. \$18.00 20¢
New Idea Dbl. Acting 45¢
No. 10 Matchless 60¢
No. 25 Unbreakable 60¢
Oxford 20¢
Reliable 60¢
Rex 1/2 gr. \$13.00 20¢
Royal 60¢ 60¢ 5¢
Samson 60¢ 60¢ 5¢
Stearns' Noiseless Floor Hinge, 1/2 set \$5.00 20¢ 10¢ 30¢
Surprise 1/2 gr. \$12.00 20¢
Union Mfg Co. 25¢
Union Spring Hinge Co.'s, list: March, '94 20¢
Wiles, No. 1, 1/2 gr. \$10; No. 2 \$13

Wrought-Iron Hinges—

Strap and T, list May 60¢ 10¢ 10¢
Corrug'd Hinge Strap and T 60¢ 10¢ 10¢
Plate Hinges, 1/8, 10 & 12 in. 5¢
Providence, 1/2 over 12 in. 4¢
Rolled Blind Hinges, Nos. 32 and 34 50¢ 10¢
Rolled Blind Hinges, Nos. 232 and 234 55¢ 10¢
Rolled Plate 70¢ 10¢
Rolled Raised 70¢ 10¢
Screw Hook and Eye 1/4 in. 1/2 in. 3/4 in. 1 in. 1 1/4 in. 1 3/4 in. 2 in. 2 1/2 in. 3 in. 3 1/2 in. 4 in. 4 1/2 in. 5 in. 5 1/2 in. 6 in. 6 1/2 in. 7 in. 7 1/2 in. 8 in. 8 1/2 in. 9 in. 9 1/2 in. 10 in. 10 1/2 in. 11 in. 11 1/2 in. 12 in. 12 1/2 in. 13 in. 13 1/2 in. 14 in. 14 1/2 in. 15 in. 15 1/2 in. 16 in. 16 1/2 in. 17 in. 17 1/2 in. 18 in. 18 1/2 in. 19 in. 19 1/2 in. 20 in. 20 1/2 in. 21 in. 21 1/2 in. 22 in. 22 1/2 in. 23 in. 23 1/2 in. 24 in. 24 1/2 in. 25 in. 25 1/2 in. 26 in. 26 1/2 in. 27 in. 27 1/2 in. 28 in. 28 1/2 in. 29 in. 29 1/2 in. 30 in. 30 1/2 in. 31 in. 31 1/2 in. 32 in. 32 1/2 in. 33 in. 33 1/2 in. 34 in. 34 1/2 in. 35 in. 35 1/2 in. 36 in. 36 1/2 in. 37 in. 37 1/2 in. 38 in. 38 1/2 in. 39 in. 39 1/2 in. 40 in. 40 1/2 in. 41 in. 41 1/2 in. 42 in. 42 1/2 in. 43 in. 43 1/2 in. 44 in. 44 1/2 in. 45 in. 45 1/2 in. 46 in. 46 1/2 in. 47 in. 47 1/2 in. 48 in. 48 1/2 in. 49 in. 49 1/2 in. 50 in. 50 1/2 in. 51 in. 51 1/2 in. 52 in. 52 1/2 in. 53 in. 53 1/2 in. 54 in. 54 1/2 in. 55 in. 55 1/2 in. 56 in. 56 1/2 in. 57 in. 57 1/2 in. 58 in. 58 1/2 in. 59 in. 59 1/2 in. 60 in. 60 1/2 in. 61 in. 61 1/2 in. 62 in. 62 1/2 in. 63 in. 63 1/2 in. 64 in. 64 1/2 in. 65 in. 65 1/2 in. 66 in. 66 1/2 in. 67 in. 67 1/2 in. 68 in. 68 1/2 in. 69 in. 69 1/2 in. 70 in. 70 1/2 in. 71 in. 71 1/2 in. 72 in. 72 1/2 in. 73 in. 73 1/2 in. 74 in. 74 1/2 in. 75 in. 75 1/2 in. 76 in. 76 1/2 in. 77 in. 77 1/2 in. 78 in. 78 1/2 in. 79 in. 79 1/2 in. 80 in. 80 1/2 in. 81 in. 81 1/2 in. 82 in. 82 1/2 in. 83 in. 83 1/2 in. 84 in. 84 1/2 in. 85 in. 85 1/2 in. 86 in. 86 1/2 in. 87 in. 87 1/2 in. 88 in. 88 1/2 in. 89 in. 89 1/2 in. 90 in. 90 1/2 in. 91 in. 91 1/2 in. 92 in. 92 1/2 in. 93 in. 93 1/2 in. 94 in. 94 1/2 in. 95 in. 95 1/2 in. 96 in. 96 1/2 in. 97 in. 97 1/2 in. 98 in. 98 1/2 in. 99 in. 99 1/2 in. 100 in. 100 1/2 in. 101 in. 101 1/2 in. 102 in. 102 1/2 in. 103 in. 103 1/2 in. 104 in. 104 1/2 in. 105 in. 105 1/2 in. 106 in. 106 1/2 in. 107 in. 107 1/2 in. 108 in. 108 1/2 in. 109 in. 109 1/2 in. 110 in. 110 1/2 in. 111 in. 111 1/2 in. 112 in. 112 1/2 in. 113 in. 113 1/2 in. 114 in. 114 1/2 in. 115 in. 115 1/2 in. 116 in. 116 1/2 in. 117 in. 117 1/2 in. 118 in. 118 1/2 in. 119 in. 119 1/2 in. 120 in. 120 1/2 in. 121 in. 121 1/2 in. 122 in. 122 1/2 in. 123 in. 123 1/2 in. 124 in. 124 1/2 in. 125 in. 125 1/2 in. 126 in. 126 1/2 in. 127 in. 127 1/2 in. 128 in. 128 1/2 in. 129 in. 129 1/2 in. 130 in. 130 1/2 in. 131 in. 131 1/2 in. 132 in. 132 1/2 in. 133 in. 133 1/2 in. 134 in. 134 1/2 in. 135

Plate.....45¢
 Romer's Night Latches.....15¢
 R. & E. Mfg. Co., list Mar. 20, 1889.....60¢@10¢70¢
 Sargent & Co., list July, 1894.....60¢@10¢70¢
 Warner's Burglar Proof.....\$8.00, 50¢

Elevator—

Moore's.....33¢

Padlocks—

Wrought Iron Padlocks:
 Brittan, Graham & Mathes, list Jan. '94.....75¢
 Mallory, Wheeler Co., list Jan. '94.....75¢
 Norwich Lock Mfg. Co., list June 10, '91.....50¢@2¢
 Russell & Erwin Mfg. Co., list June 10, '91.....50¢@2¢
 Sargent & Co., list January 1, '94.....75¢
 William Wilcox Mfg. Co., list January 1, '94.....75¢@20¢
 Ames Sword Co., up to No. 103 incl. 50¢
 Ames Sword Co., above No. 103.....50¢@10¢
 Barnes Mfg. Co., 40¢@40¢10¢
 Champion Padlock.....40¢
 A. E. Deitz.....40¢
 Eagle.....40¢
 Eureka, Eagle Lock Co.....40¢@2¢
 E. T. Fraim's Keystone Scandinavian 1010 line.....90¢50¢
 120 line.....90¢25¢
 109 line.....65¢
 510 line.....70¢10¢
 225, 610 and 209 lines.....70¢
 All other numbers.....50¢@5¢
 Horseshoe, ½ doz. \$9.....50¢@10¢
 Hotchkiss.....30¢
 Nock's.....30¢
 Romer's Nos. 0 to 91.....30¢
 Romer's Scandinavian, &c., Nos. 100 to 505.....15¢
 Scandinavian.....90¢50¢
 Slaymaker, Barry & Co., No. 1010 line.....90¢
 No. 41 line.....50¢
 No. 61 line.....60¢
 No. 21 line.....70¢
 No. 109 line.....90¢40¢
 Star.....60¢

Sash, &c —

Atwell Mfg. Co.....25¢33¢4¢
 Champion Safety, list January, 1893.....70¢5¢
 Clark's No. 1, \$10; No. 2, \$8 gr. gr. 33¢
 Common Sense, Jap'd and Brzed.....gr \$4.00
 Common Sense, Nickel Plated.....gr \$10.00

Corbin's Daisy, list Feb. 15, 1886.....70¢
 Davis Bronze, Barnes Mfg. Co.....60¢
 Ferguson's.....30¢
 Fish (Liesch's pat.), No. 100, gr. \$8.....50¢
 No. 105, gr. \$10.....70¢10¢
 Giant, list Jan., 1892.....70¢10¢
 Hammond's Window Springs, A. 50¢10¢
 Hammond's Window Springs, B. 50¢
 Hugunin's New Sash Locks.....25¢5¢2¢
 Hugunin's Sash Balances.....25¢5¢2¢
 Ives' Patent.....60¢10¢5¢60¢10¢10¢
 Kempshall's Gravity.....60¢
 Kempshall's Model.....60¢@60¢10¢
 Monarch.....50¢
 Payson's Perfect.....60¢10¢10¢
 Reading.....60¢@10¢60¢@10¢5¢
 Security.....30¢
 Universal.....30¢
 Victor.....60¢10¢2¢
 Walker's.....10¢
 Wolcott's.....60¢10¢5¢

Lumber, Tools—

See Tools, Lumber.

Lustro—

Four-ounce bottles.....½ doz. \$1.75; ½ doz. \$1.70

Machines.

Boring—

Without Augers. Upright. Angular.
 Boss, Carpenters' \$3.50
 Boss, Ship Bldrs. 3.75
 Douglas.....5.50 \$0.75.....50¢
 Jennings.....5.50 6.75.....50¢@5¢
 Miller's Falls.....7.50.....25¢
 Snell's, Rice's Pat. 5.50 6.75.....40¢10¢10¢

Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35¢
 Combined Fluter and Sad Iron.....½ doz. \$15.00.....30¢
 Crown, 4½ in., \$3.50; 6 in., \$4.00; 8 in., \$6.50 each.....35¢
 Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25.....30¢
 Crown Jewel, 6 in.....\$3.50 each.....35¢
 Domestic Fluter.....each, \$1.50.....35¢
 Eagle, 3½-inch Rolls, \$2.15.....35¢
 Eagle, 5½-inch Rolls, \$2.85.....35¢
 Knox, 4½-inch Rolls.....\$3.25 each.....35¢
 Knox, 6-inch Rolls.....\$3.60 each.....35¢

Hoisting

Moore's Anti-Friction Differential Pulley Block.....20¢
 Moore's Hand Hoist, with Lock Brake.....20¢
 Moore's Rope Differential Pulley Block.....60¢
 Maris & Beckley (Teal Patent).....30¢
 See also Blocks.

Washing—

Fair and Square.....½ doz \$42.00
 Anthony Wayne, ½ doz., No. 1, \$42; No. 2, \$36; No. 3, \$42.00.
 Wayne American.....½ doz. \$36.00
 Wellseil.....½ doz. \$36.00
 Western Star, ½ doz., No. 2, \$36; No. 3, \$39.

Mallets—

B. & L. Block Co., Hickory & L. V. 30¢10¢40¢
 Fibre Head, Stearns.....33¢4¢
 Hickory.....20¢10¢20¢10¢10¢
 Lignum vitae.....20¢10¢20¢10¢10¢

Mattocks—

Regular list.....60¢10¢10¢70¢

Measures—

Standard Fibreware, No. 1, peck ½ dozen, \$3.50; ½ peck, \$3.00.

Meat Cutters—

See Cutters, Meat.

Menders—

Harness.....½ doz., \$1.75
 Hudson's Hose Menders, in set, ½ doz. \$6.00
 Hudson's Hose Bands.....½ gr., \$1.25

Milk Cans—See Cans, Milk.

Mills—

Box and Side, Coffee—
 List, Jan. 1, 1888, 60¢@60¢10¢
 Net prices are often made which are lower than above discount.
 American, Enterprise Mfg. Co., list Jan. 17, '93.....20¢
 National list, Jan. 1, '94.....30¢
 Swift, Lane Bros.....30¢
 Wadell's New Box Mills, Ideal Brand, New list.....60¢@60¢10¢

Mincing Knives—

See Knives, Mincing.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Muzzles—

Safety.....½ doz., \$3.00, 25¢

Nails—

Cut and Wire. See Trade Report.

Wire Nails, Papered.
 Association list, May 1, '92. 85¢10¢90¢
 Hungarian, Finishing, Upholsterers, &c. See Tacks.

Horse—

Nos. 6 7 8 9 10
 A. C.....25¢ 23¢ 22¢ 21¢ 21¢
 40¢10¢
 American.....9¢ 9¢ 9¢ 9¢ 9¢.....net
 Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35¢
 Ausable.....28¢ 26¢ 25¢ 24¢ 23¢.....40¢5¢2¢
 Capewell.....19¢ 18¢ 17¢ 16¢ 15¢10¢5¢
 C. B. K.....25¢ 23¢ 22¢ 21¢ 21¢.....40¢
 Champion.....25¢ 23¢ 22¢ 21¢ 20¢.....10¢10¢10¢
 Champlain.....28¢ 26¢ 25¢ 24¢ 23¢.....40¢5¢2¢
 Clinton Fin.....19¢ 17¢ 16¢ 15¢ 14¢30¢5¢
 Empire Bronzed.....11¢11¢1¢
 Essex.....28¢ 26¢ 25¢ 24¢ 23¢.....40¢10¢50¢
 Globe.....23¢ 21¢ 20¢ 19¢ 18¢.....40¢10¢
 Lyra.....9¢ 9¢ 9¢ 9¢ 9¢.....net
 Maud S.....25¢ 23¢ 22¢ 21¢ 21¢.....50¢10¢5¢
 Northwest'n.....25¢ 23¢ 22¢ 21¢ 20¢.....25¢25¢5¢
 Putnam.....23¢ 21¢ 20¢ 19¢ 18¢.....15¢
 Snowden.....9¢ 9¢ 9¢ 9¢ 9¢.....net
 Standard.....23¢ 21¢ 20¢ 19¢ 18¢.....35¢
 Vesper.....23¢ 21¢ 20¢ 19¢ 18¢.....40¢
 Western.....23¢ 21¢ 20¢ 19¢ 18¢.....50¢

Picture—

Brass Head, Combination list.....50¢10¢
 Brass Head, Sargent's list.....60¢@60¢10¢
 Porcelain Head, Combination list.....40¢10¢
 Porcelain Head, Sargent's list.....50¢10¢10¢
 Niles' Patent.....40¢
 Nail Pullers—See Pullers, Nail.
 Nail Sets—See Sets, Nail.
 Nippers, See Pliers and Nippers.
 Nut Crackers—
 See Crackers, Nut.
 Nuts—List Dec. 18, 1889.
 Square Hex.
 Cold Punched.....5¼¢ 5¼¢ off list
 Hot Pressed.....6¼¢ 6¼¢ off list
 In packages of 100 lb, add 1-10¢ ½ doz, net; in packages less than 100 lb, add ½¢ ½ doz, net.

Oakum—

Best or Government.....½ lb 6¢@6¼¢
 Navy.....½ lb 6¢@5¼¢
 U. S. Navy.....½ lb 5¼¢@5¼¢

Oil Tanks—See Tanks, Oil.

Oilers—

Brass and Copper.....50¢10¢50¢10¢5¢
 Zinc and Tin.....70¢70¢10¢
 Broughton's Brass.....50¢
 Broughton's Zinc.....60¢
 Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40.....10¢5¢
 Malleable, Hammers' Old Pattern, same list.....50¢
 Olmstead's Brass and Copper.....50¢
 Olmstead's Tin and Zinc.....60¢
 Prior's Pat. or "Paragon" Brass.....60¢
 Prior's Pat. or "Paragon" Zinc.....50¢
 Willmot & Hobbs Mfg. Co., Steel Anti-Rust.....60¢
 Openers, Can—
 American.....½ gross \$1.75@2.00
 Champion, ½ doz.....\$2.00.....50¢
 Domestic, ½ doz.....\$2.00.....45¢
 Duplex.....½ doz 25¢, 15¢@20¢
 Eureka.....½ doz \$2.50, 10¢
 Excelsior, No. 1, \$2.50; No. 2, \$1.50.....40¢
 French, No. 4.....½ doz \$2.25, 55¢@60¢
 Iron Handle, No. 5.....½ gr \$8.00, 45¢@50¢
 Lyman's.....½ doz \$3.75, 20¢
 Steensager's Comet.....½ doz \$3.00, 25¢
 Moore's.....75¢
 Sardine Scissors.....½ doz \$2.75@3.00
 Sprague, Iron or Wood Handles.....½ gr. \$4.75@5.00
 Star.....½ doz \$2.75
 Streetside:
 Sensible, Japanned, ½ doz.....60¢
 Sensible, Nickel, ½ doz.....75¢
 Surprise, ½ doz.....25¢
 New Sprague, Metallic H'dle, ½ doz.....50¢
 New Sprague, Wood H'dle, ½ doz.....60¢
 Universal, ½ doz \$3.00.....55¢5¢
 World's Best, gr gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00.....50¢10¢

Packing, Steam—

Rubber—
 Standard, fair quality.....70¢10¢75¢
 Inferior quality.....75¢10¢80¢
 Extra.....60¢@60¢10¢
 Jenkins' Standard, ½ lb 80¢.....25¢25¢5¢
 N. Y. B. & P. Co., Double Diamond.....60¢
 N. Y. B. & P. Co., Salamander.....45¢
 N. Y. B. & P. Co., Carbon.....70¢5¢
 Miscellaneous—
 American Packing.....½ gr @ 10¢ ½ lb
 Cotton Packing.....14¢ @ 15¢ ½ lb
 Iron Packing.....12¢ @ 13¢ ½ lb
 Jute.....6¢ @ 7¢ ½ lb
 Russia Packing.....13¢ @ 14¢ ½ lb

Pails—

Creamery—
 S. S. & Co., 18-qt., \$7.00; 20-qt., \$7.25
 ½ doz.....5¢

Galvanized Pails—

Light.....Heavy
 10 Quart.....\$2.00@2.25 \$2.25@2.50
 12 Quart.....2.25@2.50 2.50@2.75
 14 Quart.....2.50@2.75 2.75@3.00

Galvanized Buckets—

Well.....Fire
 10 Quart.....\$2.50@2.75
 12 Quart.....2.75@3.00 \$2.75@3.25
 14 Quart.....3.00@3.25 3.00@3.50

Indurated Fiber Ware—

Fire Pails, deep.....½ doz. \$4.80
 Fire Pails, round bottom.....½ doz. 5.40
 Milk, 14 qt.....½ doz. 5.40
 Stable, 14 qt.....½ doz. 6.00
 Star Pails, 12 qt.....½ doz. 4.20

Standard Fiber Ware—

Plain.....Dec'd.
 Buggy Pails.....\$3.00
 Chamber Pails, 14 qt.....6.00 \$7.00
 Dairy Pails, 14 qt., ½ doz.....3.75 \$4.25
 Fire Pails, No. 1, 12 qt., ½ doz. 3.75
 Fire Pails, No. 2, 14 qt., ½ doz. 4.25
 Horse Pails.....4.00
 Slop Jars (bat trap).....7.50 \$8.50
 Sugar Pails.....4.75 \$5.25
 Water Pails, 12 qt., ½ doz.....3.00 \$3.75

Pans—

Dripping—
 Large sizes.....½ lb 5¢
 Small sizes.....½ lb 4¢
 Silver & Co. (Covered).....50¢

Fry—

Standard List:
 No. 0.....1 2 3 4
 No. 1.....\$3.00 \$4.25 \$4.75 \$5.25
 No. 2.....3.75 5.00 5.50 6.00
 No. 3.....\$6.00 \$7.00 \$8.00 \$9.00
 Polished, regular goods.....75¢75¢10¢
 Acme Fry Pans.....70¢70¢5¢

Dust—

Steel Edge, No. 1.....½ doz \$1.75

Roasting and Baking—

Columbian, S. S. & Co., Nos. 10, \$2; 20, \$2.25; 30, \$2.50 each.....60¢10¢

Paper and Cloth—

Sand and Emery—
 List April 19, 1886.....50¢10¢60¢
 Sibley's Emery and Crocus Cloth.....30¢

Parers—

Apple—

Advance.....½ doz. \$4.50
 Baldwin.....½ doz. \$5.00
 Bonanza.....each \$5.00
 Daisy.....½ doz. \$3.50
 Dandy.....each \$7.50
 Eclipse.....½ doz. \$4.00
 Eureka, 1888.....each \$16.00
 Family Bay State.....½ doz. \$12.00
 Favorite.....½ doz. \$5.00
 Gold Medal.....½ doz. \$4.00
 Ideal.....½ doz. \$4.00
 Improved Bay State ½ doz. \$27.00@30.00
 Little Star.....½ doz. \$4.00
 Monarch.....½ doz. \$13.50
 New Lightning.....½ doz. \$12.00
 Oriole.....½ doz. \$4.00
 Penn.....½ doz. \$3.00
 Perfection.....½ doz. \$4.00
 Reading 72.....½ doz. \$4.00
 Reading 78.....½ doz. \$7.00
 Rocking Table.....½ doz. \$5.00
 Turn Table.....½ doz. \$4.50
 Victor.....½ doz. \$13.50
 Waverly.....½ doz. \$3.75
 White Mountain.....½ doz. \$4.00

Potato—

Antrim Combination.....½ doz. \$5.50
 Saratoga.....½ doz. \$5.50
 White Mountain.....½ doz. \$5.50

Pencils, Soapstone—

See Crayons.

Pickers, Fruit—

Prize Fruit Pickers.....50¢

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.....60¢10¢10¢70¢

Picture Nails—

See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—

Humason, Beckley & Co.'s.....70¢@70¢10¢
 Peck, Stow & W. Co.....60¢10¢60¢10¢10¢
 Sargent & Co.'s \$17 and \$18.....60¢10¢60¢10¢10¢

Escutcheon—

Brass.....70¢
 Iron, list Nov. 11, '85.....75¢

Pipe, Wrought Iron—

List April 13, '93.
 1¼ and under, Plain, 57½¢10¢10¢10¢5¢
 1½ and under, Galv.....50¢10¢10¢10¢5¢
 1¾ and over, Plain.....67½¢10¢10¢10¢5¢
 1½ and over, Galv.....57½¢10¢10¢10¢5¢
 Boiler Tubes, list Oct. 24, '92.....65¢10¢10¢10¢5¢
 Casing, list Nov. 10, '92.....52½¢10¢10¢10¢5¢

Cold Drawn Seamless Steel Tubing.....50¢
 Inserted Joints Casing, list Nov. 10, '92.....47½¢10¢10¢10¢5¢
 Steel Boiler Tubes.....27½¢10¢10¢10¢5¢

Planes and Plane Irons—

Wood Planes—

Molding.....50¢10¢50¢10¢5¢
 Bench, First quality.....55¢10¢55¢10¢5¢
 Bench, Second quality.....60¢10¢10¢70¢
 Bailey's (Stanley R. & L. Co.).....50¢10¢
 Iron Planes—
 Bailey's (Stanley R. & L. Co.).....50¢10¢
 Derby Plane Co.....70¢
 Chaplin's Iron Planes.....50¢10¢60¢
 Gage Tool Co.'s Self-Setting.....35¢
 Miscellaneous Planes (Stanley R. & L. Co.).....25¢10¢
 Sargent's.....60¢10¢60¢10¢5¢
 Standard Tool Co.....60¢10¢10¢70¢
 Steers' Iron Planes.....50¢10¢50¢10¢5¢

Plane Irons—

Auburn Thistle.....30¢10¢30¢10¢10¢
 Buck Bros.....\$5.00@5.25 to £
 Butler's.....30¢10¢30¢10¢10¢
 Sandusky.....30¢10¢30¢10¢10¢
 Stanley R. & L. Co.....50¢10¢
 L. & J. White.....25¢

Plates—

Felice.....½ lb 6¢@6¼¢

Pliers and Nippers—

Button's Patent.....60¢
 Carew's Pat. Wire Cutters.....20¢
 Cronk's Stub's Pat. Pliers.....50¢
 Cronk's Button Pattern.....70¢
 Eureka Pliers and Nippers.....40¢
 Gas Pliers.....60¢
 Gas Pliers, Custer's Nickel Plated, 60¢5¢
 Hall's Nippers, No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 ½ doz.....40¢10¢
 Hall's Pliers.....70¢
 Humason & Beckley Mfg. Co., 50¢50¢10¢
 Lindsay's Giant, No. 55, 5 in., ½ doz. \$10.50.....33¢4¢
 Morrill's Parallel, ½ doz. \$12.00.....30¢5¢
 P. S. & W. Cast Steel.....50¢50¢5¢
 P. S. & W. Timmers' Cutting Nippers, add 6¢
 Russell's Parallel.....10¢
 Waterbury Nip's, 5 in., ½ doz. \$7.50, 33¢4¢

Plumbs and Levels—

Regular list.....75¢10¢80¢
 Cook's.....40¢10¢
 Davis Inclinoimeters.....10¢10¢
 Davis Iron Levels.....30¢
 Disston's.....50¢50¢10¢
 Pocket Levels.....70¢10¢70¢10¢10¢
 Stanley's Duplex.....20¢10¢
 Stanley's Handy.....20¢10¢

Poachers, Egg—

Buffalo Steam Egg Poachers, ½ doz., No. 1, \$6.00; No. 2, \$8.00.....33¢4¢
 Silver & Co., 8-Ring, ½ doz. \$3.60; 3-Ring.....\$1.80

Pokes Animal—

Bishop's American.....½ doz. \$2.50
 Bishop's I. X. L.....½ doz. \$5.25
 Bishop's Steel Monarch.....½ doz. \$4.25
 Bishop's Pioneer.....½ doz. \$5.25
 Bolding.....½ doz. \$5.00
 Buckeye Single Stale.....½ doz. \$2.50
 Columbia, Double Stale.....½ doz. \$5.00
 Eagle, Double Stale.....½ doz. \$5.00
 Eagle, Single Stale.....½ doz. \$3.25
 Metallic Horse Poke.....½ doz. \$5.00

Police Goods—

Daley's Improved Handcuffs; 2 Hands, Polished, ½ doz. \$4.00; 3 Hands, \$5.70; 2 Hands, Polished, ½ doz. \$7.20; Nickleed, \$8.40.....25¢
 J. P. Lovell's Police Goods.....25¢
 Newhall Ship Chandlery Co. Handcuffs, \$15.00 ½ doz.....25¢
 Tower's.....25¢

Polish—

Metal—

Gaston's Silver Compound.....33¢4¢
 Prestoline.....33¢4¢
 Prestoline Paste.....33¢4¢
 Tanite Mills:
 Paste, ¼ lb tins.....½ gr. \$14.40 | 5¢
 Paste, 1 lb tins.....½ gr. \$3.00 | 5¢
 Liquid, ¼ lb.....½ gr. \$36.00 | 5¢
 Powder, 1 lb.....½ gr. \$36.00 | 5¢
 Wynn's White Silk, ½ pt. cans ½ doz. \$1.57

Stove—

Black Eagle Benzine Paste, 5 and 10 lb cans.....12¢4¢
 Black Flag, 5 and 10 lb pails.....10¢, 25¢
 Black Jack Water Paste, 5 and 10 lb cans.....12¢
 Bonelli's Liquid Stove Polish.....½ gr. \$9.00
 Bonelli's Paste Stove Polish.....½ gr. \$8.00
 Boynton's Noon Day.....½ gr. \$13.00
 Crown Paste.....½ gr. \$7.20
 Crown Paste in 5 and 10 lb pails, ½ lb 12¢
 Diamond O. K. Enamel.....½ gr. \$19.00
 Diamond Rock Nickel Cleaner.....½ gr. \$1.20
 Joseph Dixon's, ½ gr. \$6.00.....10¢
 Dixon's Plumbago.....½ gr. \$2.50
 Fireside.....½ gr. \$2.50
 Gem, ½ gr. \$4.50.....10¢
 Gold Medal, ½ gr. \$6.00.....25¢
 Japanese.....½ gr. \$3.50
 Jet Black.....½ gr. \$4.50
 Nickel Plate Paste.....½ gr. \$6.00
 Parlor Pride Stove Enamel, ½ gr. \$8.50
 Raven Liquid, 6 oz. bottles.....½ gr. \$9.00
 Raven Liquid, 8 oz. bottles.....½ gr. \$9.00
 Raven Paste in 5 lb pails:
 Case of 6 pails.....½ lb 10¢
 Case of 12 pails.....½ lb 9¢
 Case of 3 pails, 9 lb.....½ lb 8¢
 Raven Water Polish, large boxes.....½ gr. \$6.00
 Rising Sun.....½ gr. \$5.50@5.75
 Ruby.....½ gr. \$3.75
 Sun Paste No. 10.....½ gr. \$7.20
 Sun Paste No. 5.....½ gr. \$4.50
 Wynn's Black Silk, 5 lb pail.....½ gr. \$15.40
 Wynn's Black Silk, ½ lb box, ½ gr. \$12.00
 Wynn's Black Silk, 5oz. box, ½ gr. \$9.00

Pruning Hooks and Shears—See Shears.

Pullers Nail—
Eclipse, $\frac{1}{2}$ doz. \$24.00. 40%
Economy, $\frac{1}{2}$ doz. \$5.50@6.00
Ellrich, $\frac{1}{2}$ doz. \$10.00
Giant, No. 1 $\frac{1}{2}$ doz. \$18.00; No. 1 $\frac{1}{2}$ doz. \$15.00.
No. 2 \$15.00. 20%
Pelican, $\frac{1}{2}$ doz. \$8.00. 25%
Scranton, $\frac{1}{2}$ doz. \$18.00, 33% $\frac{1}{2}$ doz. \$10.00

Pulleys—

Brass Screw. 70%
Hay Fork, "Anti-Friction," 5-in solid. 50%
Hay Fork, "F" Common and Patent. 20%
Hay Fork, Moore's Anti-Friction, 5-in. 20%
Wheel, $\frac{1}{2}$ doz. \$12.00. 40%
Hay Fork, Reed's Self-Lubricating. 60%
Hay Fork, Solid Eye, \$4.00; Swivel. 50%
Hay Fork, Stearns' No. 35 & 45. 50%
Hay Fork, Tarbox Pat. Iron. 20%
Hot House, Awning, &c. 60%
Japanned Clothes Line. 60%
Japanned Screw. 70%
Japanned Side. 70%
Moore's Ceiling Band, Anti-Friction. 40%
Moore's Dumb Waiter, Anti-Friction. 40%
Moore's Electric Light. 33%
Moore's Side, Anti-Friction. 50%
Sash (Auger Mortise). On bbl. lots ex. 5%
Common Sense. 60%
Empire. 60%
Acme. 60%
Ideal, Nos. 2, 4, 10 & 15. 60% less $\frac{1}{2}$ doz. net.
Star. 60%
Ideal, or IXL No. 60. $\frac{1}{2}$ doz. 23% net.
Shade Rack. 45%
Shepard's Niagara, No. 25, $\frac{1}{2}$ doz. 23% net.
Tackle Blocks—See Blocks.

Pumps—

Cleburn, Best Makers. 60%
Pitcher Spout, Best Makers. 70%
Pitcher Spout, Cheaper g'ds. 75%
Myers' Pumps, low list. 50%
Detroit Valve & Washer Co.'s Pump. 60%
Leathers. 60%

Punches—

Avery's Revolving. 40%
Bemis & Call Co.'s Sawset. 50%
Bemis & Call Co.'s Steel Drive. 50%
Bemis & Call Co.'s Chisel. 50%
Bemis & Call Co.'s Spring. 50%
Bemis & Call Co.'s Springfield Socket. 65%
Niagara Hollow Punches. 20%
Niagara Solid Punches. 55%
Rice Hand Punches. 15%
Saddlers' or Drive, good. $\frac{1}{2}$ doz. 60%
Spring, good quality. $\frac{1}{2}$ doz. \$2.50@2.60
Spring, Leathers' Pat. $\frac{1}{2}$ doz. 15%
Solid Timmers', P. S. & W. Co., $\frac{1}{2}$ doz. 55%
Hollow Timmers', P. S. & W. Co., 20%
Hollow Timmers', P. S. & W. Co., 20%
Hollow Timmers', P. S. & W. Co., 20%

Rail—

Barn Door, Light. In. $\frac{1}{2}$ 3/4 2 1/2
B. D., for N. E. Hangers: 2 1/2 2 3/4 2 5/8
100 feet. Small, Med. Large.
Cronk's Double Braced Steel Rail, $\frac{1}{2}$ foot. 3 1/2 4 1/2 5 1/2
Lundy Parlor Door, Planed Edge, $\frac{1}{2}$ ft. 7 1/2
Moody Steel Rail, $\frac{1}{2}$ ft. 5 1/2 4 5/8 5 1/8
Moore's Steel Rail. 35%
Sliding Door, Bronzed Wrt Iron. $\frac{1}{2}$ ft. 6 1/2
Sliding Door, Iron, Painted. $\frac{1}{2}$ ft. 2 1/2
Sliding Door, Wrt Brass. $\frac{1}{2}$ ft. 3 1/2 4 1/8 4 3/8
Terry's Steel Rail. $\frac{1}{2}$ ft. 4 1/2 5 1/8 5 3/8
Victor Track Rail, $\frac{1}{2}$ ft. 7 1/2 5 1/8 5 3/8

Rakes—

Cast Steel, Association g'ds. 70%
Cast Steel, outside g'ds. 70%
Malleable, good. 70%
Fort Madison, Prize Bow Brace and Peerless. 85%
Fort Madison Steel Tooth Lawn Rake. 25%
Gibbs. 40%
Gibbs' Acme Lawn Rake. $\frac{1}{2}$ doz. \$4.90
Gibbs' Canton Lawn Rake. $\frac{1}{2}$ doz. \$3.75
Gibbs' Crown Lawn Rake, No. 1. $\frac{1}{2}$ doz. \$4.90; No. 2. $\frac{1}{2}$ doz. \$3.80
Gibbs' Favorite Lawn Rake. $\frac{1}{2}$ doz. \$3.90
Gibbs' Hustler No. 0. $\frac{1}{2}$ doz. \$4.25
Gibbs' Hustler No. 1. $\frac{1}{2}$ doz. \$4.40
Onida Lawn Rake. $\frac{1}{2}$ doz. \$6.00

Razors—

Campbell Cutlery Co. 50%
Electric Cutlery Co. Net prices
Galvanic. $\frac{1}{2}$ doz. \$15.00
Jordan's AAAI, new list. Net prices
Jordan's Old Faithful, new list. Net prices
J. R. Torrey Razor Co. Net prices
Wostenholm and Butcher, \$10 to £. 10%

Razor Straps—

See Straps, Razor.

Reels

Clothes Line— 33% $\frac{1}{2}$ doz. \$10.00

Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Popolo and Salmon, Single Action, Multiplying and Quadruple, sizes. 25%
Hendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PRN, 202 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor 50%
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2004N, 2004P and PN, 002904N, 0924 and 0024N, 5000N and PN. 40% $\frac{1}{2}$ doz. \$10.00

Registers—

Moore's Bronze Finishes. 75%
Moore's Electroplated. 80%
Moore's Japanned. 80%
Moore's Solid Bronze. 80%
Moore's Stone Pipe. 33%

Cash Registers—

Morford. each. \$35.00

Rings and Ringers—

Bull Rings— 80%
Humason, Beckley & Co.'s. 80%
Peck, Stow & W. Co.'s. 80%
Sargent's. 80%

Hog Rings and Ringers—

NOTE.—The market on Hog Rings and Ringers is in a demoralized condition and prices are low and irregular. We therefore withdraw quotations for the present.

Rivets and Burrs—

Copper. 60% $\frac{1}{2}$ doz. \$10.00

Iron Norway, list Nov. 1, '94. 65%
Second quality. 75%

Rivet Sets—See Sets.

Roasting and Baking Pans—See Pans, Roasting and Baking

Rods—

Stair, Black Walnut. $\frac{1}{2}$ doz. 40%
Stair, Brass. 25% $\frac{1}{2}$ doz. \$10.00

Rollers—

Acme Moore's Anti-Friction. 50%
Barn Door, Sargent's list. 60%
Lancet, Stay. 33%
Moore's Barn Door Stay. 50%
Union Barn Door Roller. 70%
Thompson's Mfg. Co.'s Lawn Rollers. 30%

Rope—The following prices are f.o.b. New York or factory, and are shaded $\frac{1}{4}$ @ $\frac{1}{2}$ ¢ on large lots; terms, 1% for cash.

Manila, 7-16 in. diam. and larger. 70%
Manila, 1/4 and 5/16 in. 84%
Manila, 3/8 and 1/2 in. 84%
Manila, Tarred Rope. 74%
Manila, Hay Rope, Med'm. 74%
Sisal, 7-16 in. and larger. 54%
Sisal, 1/4 and 5/16 in. 64%
Sisal, Hay Rope. 54%
Sisal, Tarred Rope. 44%
Sisal, Medium Lath Yarn. 44%
New Zealand, 7-16 in. and larger. 54%
New Zealand, 1/4 and 5/16 in. 54%
New Zealand Hay Rope. 54%
New Zealand Tarred Rope. 44%
Cotton Rope. 12%
Jute Rope. 12%

Wire Rope—

List Sept. 1, '94. All kinds. 20%

Rules—

Box, 60. 80%
Ivory. 50%
Starrett's Steel Rules and Straight Edges. 25%
Sad Irons— 25%
See Irons, Sad.

Sand and Emery Paper and Cloth—

See Paper and Cloth.

Sash Cords—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—

NOTE.—Extra 5@10% often given.

Atkins' Circular. 50%
Atkins' Band. 50%
Atkins' Cross Cuts, new list. 50%
Atkins' Mulay, Mill and Drag. 50%
Atkins' One-Man Saw. 40%
Atkins' Wood Saws. 40%
Atkins' Hand, Compass, &c. 40%
Disston's Circular. 45%
Disston's Cross Cut, list Jan. 1, '93. 40%
Disston's Hand. 25%
C. E. Jennings & Co.'s. 25%
Peace Circular and Mill. 45%
Peace Cross Cuts, list Jan. 1, '93. 45%
Peace Hand, Panel and Rip. 25%
Richardson's Circular and Mill. 45%
Richardson's Cross Cuts, list Jan. 1, '93. 45%
Richardson's Hand. 25%
Simonds' Circular Saws. 45%
Simonds' Crescent Ground Cross Cut Saws. 30%
Simonds' One-Man Cross Cuts. 40%
Simonds' Gang Mill, Mulay and Drag. 45%
Wheeler, Madden & Clemson Mfg. Co. 45%
Cross Cuts, list Jan. 1, '93. 45%
Hand, Panel and Rip. 30%
Woodrough & McParlin. 30%
Cross Cuts, list Jan. 1, '93. 45%
Hand, Panel and Rip. 25%
Hack Saws— 25%
Eureka and Crescent. 40%
Griffin's complete. 40%
Griffin's Hack Saw Blades. 40%
Star Hack Saws and Blades. 25%

Scissors—

Barnes' No. 1, \$8; No. 6, \$10; No. 7, \$15. 25%
Barnes Scroll Saw Blades. 35%
Lester, complete, \$10.00. 25%
Rogers, complete, \$4.00. 25%

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scale Beams—

See Beams, Scale.

Sales—

Chatillon's Eureka. 25%
Chatillon's Favorite. 40%
Chatillon's Grocers' Trip Scales. 50%
Family, Turnbills. 30%
Hatch, Counter, No. 171, good quality. 30%
Hatch, Tea, No. 161. $\frac{1}{2}$ doz. \$17.00@18.00
Riehle Bros' Platform. 40%
Union Platform, Plain. 40%
Union Platform, Striped. 25%
Standard. 50%

Scissors, Fluting

Scrapers— 45%
Adjustable Box Scraper (S. R. & L. Co.) \$6.00. 40%
Box, 1 Handle. $\frac{1}{2}$ doz. \$2.00. 40%
Box, 2 Handle. $\frac{1}{2}$ doz. \$3.00@4.00. 40%
Foot. 50%
Ship. Common. $\frac{1}{2}$ doz. \$3.50. 10%
Ship. R. I. Tool Co. 10%
Tatum's Box. 10%

Screen Window and Door Frames—See Frames.

Screw Drivers—

See Drivers, Screw.

Screws—

Bench and Hand— 55%
Bench, Iron. 55%
Bench, Wood, Beech. $\frac{1}{2}$ doz. \$2.25. 20%
Bench, Wood, Hickory. 20%
Hand, Wood. 25%
Hand, Grand Rapids. 35%

Chisel, Lag and Hand Rail—

See Lag and Hand Rail.

Coach and Lag, Gimlet Point, list Jan. 1, '90. 80%
Coach and Lag, Gimlet Point, list Jan. 1, '90. 80%

Hand Rail, Am. Screw Co. 80%
Hand Rail, H. & B. Mfg. Co. 75%
Hand Rail, Sargent's. 70%

Jack Screws

Millers Falls. 50%
Millers Falls, Roller. 50%
P. S. & W. 35%
Sargent. 70%
Stearns'. 40%
Tatum's. 25%

Cork

Detroit Cork Screw Co. 33%
Humason & Beckley Mfg. Co. 40%
Williamson's. 33%
Williamson's Forged Worm, Applewood Handle, $\frac{1}{2}$ doz. \$5.00; Rosewood, \$5.50. 40%

Machine—

Flat Head, Iron. 45%
Round Head, Iron. 40%

Wood—

List January 1, '91. 85%
Flat Head, Iron. 85%
Round Head, Iron. 75%
Round Head, Brass. 85%
Round Head, Bronze. 80%
Round Head, Bronze. 75%
Rogers' Drive Screws. 87%

Scroll Saws—see Saws, Scroll.

Scythes—

Grass. 40%
Grass. 40%

Scythe Snaths—

See Snaths, Scythe.

Sets—

Alken's Sets, Awls and Tools: No. 20, $\frac{1}{2}$ doz. \$10.00. 60%
Common Brad Sets: No. 42, \$10.50; No. 43, \$12.50. 70%
No. 44, \$10.50. 70%
No. 45, \$12.50. 70%
No. 46, \$10.50. 70%
No. 47, \$12.50. 70%
No. 48, \$10.50. 70%
No. 49, \$12.50. 70%
No. 50, \$10.50. 70%
No. 51, \$12.50. 70%
No. 52, \$10.50. 70%
No. 53, \$12.50. 70%
No. 54, \$10.50. 70%
No. 55, \$12.50. 70%
No. 56, \$10.50. 70%
No. 57, \$12.50. 70%
No. 58, \$10.50. 70%
No. 59, \$12.50. 70%
No. 60, \$10.50. 70%

Awl and Tool—

Alken's Sets, Awls and Tools: No. 20, $\frac{1}{2}$ doz. \$10.00. 60%
Common Brad Sets: No. 42, \$10.50; No. 43, \$12.50. 70%
No. 44, \$10.50. 70%
No. 45, \$12.50. 70%
No. 46, \$10.50. 70%
No. 47, \$12.50. 70%
No. 48, \$10.50. 70%
No. 49, \$12.50. 70%
No. 50, \$10.50. 70%
No. 51, \$12.50. 70%
No. 52, \$10.50. 70%
No. 53, \$12.50. 70%
No. 54, \$10.50. 70%
No. 55, \$12.50. 70%
No. 56, \$10.50. 70%
No. 57, \$12.50. 70%
No. 58, \$10.50. 70%
No. 59, \$12.50. 70%
No. 60, \$10.50. 70%

Common Brad Sets—

No. 42, \$10.50; No. 43, \$12.50. 70%
No. 44, \$10.50. 70%
No. 45, \$12.50. 70%
No. 46, \$10.50. 70%
No. 47, \$12.50. 70%
No. 48, \$10.50. 70%
No. 49, \$12.50. 70%
No. 50, \$10.50. 70%
No. 51, \$12.50. 70%
No. 52, \$10.50. 70%
No. 53, \$12.50. 70%
No. 54, \$10.50. 70%
No. 55, \$12.50. 70%
No. 56, \$10.50. 70%
No. 57, \$12.50. 70%
No. 58, \$10.50. 70%
No. 59, \$12.50. 70%
No. 60, \$10.50. 70%

Henry Combination Haft—

Miller's Falls Adj. Tool H'ds, No. 1. \$12; No. 4, \$12; No. 5, \$18. 25%
Stanley's Excelsior: No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50. 30%

Nail—

Round. $\frac{1}{2}$ gr. \$3.25. 25%
Square. $\frac{1}{2}$ gr. \$4.00@4.25. 27%
Buck Bros. 27%
Cannon's Diamond Point. $\frac{1}{2}$ gr. \$12. 20%

Rivet—

Regular list. 70%

Saw

Atkin's Circular. $\frac{1}{2}$ doz. No. 1, \$8.00. 50%
Atkin's Gritter. $\frac{1}{2}$ doz. No. 1, \$10.00. 50%
Atkin's Imitation. $\frac{1}{2}$ doz. \$3.00@3.25. 50%
Atkin's Lever. $\frac{1}{2}$ doz. No. 1, \$8.00. 50%
Avery's Saw Set and Punch. 50%
Bemis & Call Co.'s Cross Cut. 30%
Bemis & Call Co.'s Plate. 20%
Bemis & Call Spring Hammer. 30%
Common Lever. $\frac{1}{2}$ doz. \$2.00. 45%
Croissant (Keller), No. 1, \$15.00. 45%
2, \$24.00. 40%
Disston's Star. 25%
Hammer, Bemis & Call Co. s new Pat. 45%
Hammer, Hotchkiss, \$5.50. 10%
Kohler's Giant Royal. $\frac{1}{2}$ doz. \$12.00. 40%
Kohler's Royal. $\frac{1}{2}$ doz. \$7.00. 40%
Leach's, No. 0, \$8; No. 1, \$15. 15%
Leopold. 40%
Lloyd's Acme. $\frac{1}{2}$ doz. \$15. 40%
Norris's No. 1, \$15.00. 40%
No. 2, \$20.00. 40%
No. 3, \$25.00. 40%
No. 4, \$30.00. 40%
No. 5, \$35.00. 40%
No. 6, \$40.00. 40%
No. 7, \$45.00. 40%
No. 8, \$50.00. 40%
No. 9, \$55.00. 40%
No. 10, \$60.00. 40%
No. 11, \$65.00. 40%
No. 12, \$70.00. 40%
No. 13, \$75.00. 40%
No. 14, \$80.00. 40%
No. 15, \$85.00. 40%
No. 16, \$90.00. 40%
No. 17, \$95.00. 40%
No. 18, \$100.00. 40%
No. 19, \$105.00. 40%
No. 20, \$110.00. 40%
No. 21, \$115.00. 40%
No. 22, \$120.00. 40%
No. 23, \$125.00. 40%
No. 24, \$130.00. 40%
No. 25, \$135.00. 40%
No. 26, \$140.00. 40%
No. 27, \$145.00. 40%
No. 28, \$150.00. 40%
No. 29, \$155.00. 40%
No. 30, \$160.00. 40%
No. 31, \$165.00. 40%
No. 32, \$170.00. 40%
No. 33, \$175.00. 40%
No. 34, \$180.00. 40%
No. 35, \$185.00. 40%
No. 36, \$190.00. 40%
No. 37, \$195.00. 40%
No. 38, \$200.00. 40%
No. 39, \$205.00. 40%
No. 40, \$210.00. 40%
No. 41, \$215.00. 40%
No. 42, \$220.00. 40%
No. 43, \$225.00. 40%
No. 44, \$230.00. 40%
No. 45, \$235.00. 40%
No. 46, \$240.00. 40%
No. 47, \$245.00. 40%
No. 48, \$250.00. 40%
No. 49, \$255.00. 40%
No. 50, \$260.00. 40%
No. 51, \$265.00. 40%
No. 52, \$270.00. 40%
No. 53, \$275.00. 40%
No. 54, \$280.00. 40%
No. 55, \$285.00. 40%
No. 56, \$290.00. 40%
No. 57, \$295.00. 40%
No. 58, \$300.00. 40%
No. 59, \$305.00. 40%
No. 60, \$310.00. 40%

Stillman's Pattern, Hand, $\frac{1}{2}$ doz. \$3.25. 40% Cross Cut, \$6.50. 55% Taintor Positive, $\frac{1}{2}$ doz. \$18. 60%

Sharpeners, Knife—

Parkin's: Applewood Handles, $\frac{1}{2}$ doz. \$6.00. 50%
Rosewood or Cocobola, $\frac{1}{2}$ doz. \$9. 50%
Tantite Mills, $\frac{1}{2}$ gr. \$14.40. 25%

Shaves, Spoke—

Iron. 45%
Wood. 30%
Bailey's (Stanley R. & L. Co.). 50%
Cincinnati. 25%
Goodell's, $\frac{1}{2}$ doz. \$9.00. 25%
Stearns'. 40%
Tatum's. 25%

Shears—

Acme Cast Shears. 40%
American Cast Iron. 75%
Barnard's Lamp Trimmers. $\frac{1}{2}$ doz. \$3.75. 75%
Barnard, Solid Steel Blade, Jap'd. 75%
Barnard, Solid Steel Blade, Nickleplated. 65%
Cast Steel Trimmers: First quality. 80%
Second quality. 80%

Covert, New R. E. 80&10&5&2 1/2
Fitch's Bristol 50
Fitch's National 50&10&5
Fitch's Clipper 60&10
Fitch's Union 60&10
Fitch's Champion 60&10
German, new list 40&10
Kelley & Woolworth's Steel Harness 60&10&5
John Protz Snaps 75&75&5
Sargent's Patent Guarded 70&10&10&10

Snaths 60&10&5
Scythe 60&10&5

Snips, Tinnerns'—See Shears.

Soldering Irons—
See Irons, Soldering.

Spittoons, Cuspidors, &c.
Standard Fiber Ware—
Cuspidors, 8 1/2-inch, 3 doz., No. 3, \$5; No. 5, \$3

Spittoons, Daisy, 8-inch, No. 1, 4, 10 and 11 inch, \$8.

Spoke Shaves—
See Shaves, Spoke.

Spoke Trimmers—
See Trimmers, Spoke.

Spoons and Forks—
Tinned Iron—

Basting, Cen. Stamp. Co.'s list, 70&25
Buffalo, S. S. & Co., 33 1/2&25
Solid Table and Tea, Cen. Stamp. Co.'s list, 70&25

'Silver Plated—
4 months or 5¢ cash 30 days:

L. Boardman & Son 50&12 1/2
Holmes & Edwards Silver Co. 40&15&5
Meriden Brit. Co., Rogers 40&15
Reed & Barton 40&15
Rogers & Bros. 40&15
C. Rogers & Bros. 40&15
Rogers & Hamilton 40&15
Wm. Rogers Mfg. Co. 40&15&5
Simpson, Hall, Miller & Co. 40&15&5

Miscellaneous—

Bordman's Britannia Spoons, case lots, 60&5 cash
Boardman's Nickel Silver, list July 1, 60&7 1/2
Britannia 60&60&5
German Silver 50&50&5
Nickel Silver 50&50&10&5 cash
Holmes & Edwards Silver Co.:
No. 24 German Silver 50&10&5
No. 30 Silver Metal 50&10&5
No. 49 Nickel Silver 50&10&5
No. 50 Nickel Silver 50&5
No. 67 Mexican Silver 50&10&5
Rogers & Hamilton:
Cimeter, Flatware 40&15&5
Cimeter Steel Goods 40&10
Crown Hamilton, Flatware and Cutlery 30
Steel Goods 40&10
Wm. Rogers Mfg. Co.:
18¢ Rogers' German Silver 60&6
22¢ Rogers' Nickel Silver 50&5
Rogers' Silver Metal 50&10&5

Spring—Door

Champion (Coil) 55&10&55&10&5
Cowell's, No. 1, 3 doz. \$18.00; No. 2, \$15.00
Gem (Coil), list April 19, '86, 20¢
Hercules 50&50&10
Phoenix 33 1/2&33 1/2&33 1/2
Rubber, complete, 3 doz. \$5.50, 6 doz. \$7.00
Star (Coil), list April 19, '86, 50¢
Torrey's Rod, 30 in., 3 doz. \$1.20, 12 doz. \$3.40
Warner's No. 1, 3 doz. \$1.50; No. 2, \$3.40
Victor (Coil) 60&10&60&10&5

Carriage, Wagon, &c.

Elliptic, Concord, Platform and Half Scroll 60&10/60&10&10&10 or net prices
Cliff's Bolster Springs 25¢

Sprinklers, Lawn—

Gibbs' Arc 3 doz. \$12.00
Gibbs' Hustler 3 doz. \$6.00

Squares—

Nickel-Plated 85&85&5
Steel and Iron, T & Bevels 60&10&10
Avery's Bevel Protractor 50¢
Avery's Flush Bevel Squares 40¢
Disston's Try Sq. and T Bevels 50¢&10
Starrett's Micrometer Caliper Sq's 25¢
Winterbottom's Try and Miter 30&10

Squeezers—Fodder—

Blair's 3 doz. \$2.00
Blair's "Climax" 3 doz. \$1.00

Lemon—

Porcelain Lined, No. 1, 3 doz. \$6.00, 25&30
Wood, Common 3 doz. \$1.75, 75¢
Wood, No. 2 3 doz. \$3.00, 75¢
Dean's, No. 1, 3 doz. \$6.50; 2, \$3.35; 3, \$1.05; Queen, \$2.50
Dunlap's Improved 3 doz. \$2.75, 20¢&10
Hotchkiss Straight Flash 3 doz. \$9.60
Jennings' Star 3 doz. \$2.50
King 4 doz. \$2.50
Little Giant 50&50&5
The Boss 3 doz. \$2.50

Standard Fiber Ware—
See Ware, Standard Fiber.

Staples—

Barbed Blind, 1/2 in. and larger, 7 7/8¢
Barbed Blind, 3/4 in. 8 1/2¢
Fence Staples, Galvanized, Same Price
Fence Staples, Plain, Same Price
Grand Crossing Tack Co.'s list, 75&10

Steels, Butchers'—

C. & A. Hoffmann's 40¢
Nichols Bros. 50¢

Steelyards—

Blacksmith's 35¢
Butterfield's Goods 35¢
Waterford Goods 35¢
Gardner 25¢
Green River 25¢&30¢
Lightning Screw Plate 25¢&30¢
Reece's New Screw Plates 25¢&30¢
Reversible Ratchet 35¢

Stone

Stones, Grind—See Grindstones.
Scythe Stones—

Pike Mfg. Co., list April, '92, 33 1/2¢
Cleveland Stone Co., list Nov. '92, 33 1/2¢

Oil Stones, &c.

Pike Mfg. Co.:
Hindustan No. 1, 3 doz. 8¢
Sand Stone 40&40&5
Turkey Oil Stone, 4 to 8 1/2 10¢
Turkey Slips 2.00
Lily White Washita 60¢
Rosy Red Washita 60¢
Washita Stone, Extra 50¢
Washita Stone, No. 1 40¢
Lily White Slips 30¢
Rosy Red Slips 30¢
Washita Slips, Extra 30¢
Washita Slips, No. 1 70¢
Arkansas Stone, No. 1, 3 to 5 in. \$2.50
Arkansas Stone, No. 15 1/2 to 8 in. \$3.50
Lake Superior 13¢
Lake Superior Slips 20¢
Tanite Mills:
Emery Oil, 3 doz. \$9.00 50¢&65¢

Stops, Bench—

Cincinnati 25&10
Crescent 10¢
Hotchkiss 3 doz. \$5 10¢&10¢
McGills 3 doz. \$3 10¢
Millers Falls 25¢
Morrill's 3 doz. No. 1, \$11.00; No. 2, \$11.00, 40¢&20¢
Stearns' 20&10
Terrell's Nos. 1 and 2, 3 doz. \$3; No. 3, \$3.80 30¢
Weston's, No. 1, \$10; No. 2, \$9.25&10&5

Stove Polish—See Polish, Stove.

Stretchers, Carpet—

Cast Iron, Steel Points 3 doz. 75¢&60¢
Cast Steel, Polished 3 doz. \$2.25
Socket 3 doz. \$1.75
Bullard's 25&10&40¢

Strops, Razor—

Emerson C. Buff. 3 doz. \$2.80&3.00
Imitation Emerson 3 doz. \$1.25&1.50
Jordan's Pat. Padded, list Nov. 1, '89, 50¢
Lamont Combination 3 doz. \$4.00

Stuffer, Sausage—

Miles' Challenge, 3 doz. \$20 50¢&50¢
Perry, 3 doz. No. 1, \$15.00; No. 2, \$21.00 50¢&50¢&10¢
Draw Cut No. 4, each \$30.00 20¢
Enterprise Mfg. Co., list Jan. 17, '93, 25¢
Silvers 40&10

Sweepers, Carpet and Lawn—Carpet—

Acme 3 doz. \$26.00
Advance 3 doz. \$18.00
Grand 3 doz. \$36.00
Gold Medal 3 doz. \$27.00
Premier 3 doz. \$27.00
Superior 3 doz. \$27.00
Cosmopolitan 3 doz. \$27.00
Furniture Protector, Jap. 3 doz. \$24.00
Furniture Protector, Nickel 3 doz. \$27.00
Furniture Protector, Ocean 3 doz. \$27.00
Hall 3 doz. \$45.00
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00
Domestic, No. 1 3 doz. \$21.00
Domestic, No. 2 3 doz. \$22.00
Easy Jap'd, 3 doz. \$22.00; Nickel, \$24.00
Garland 3 doz. \$22.00
Gilt Edge 3 doz. \$24.00
Grand Rapids, Japanned 3 doz. \$24.00
Grand Rapids, Nickel 3 doz. \$27.00
Housewife's Delight 3 doz. \$15.00
Improved Parlor Queen 3 doz. \$24.00
L. Nickle 3 doz. \$27.00
Ladies' Friend 3 doz. \$15.00
Ladies' Friend No. 2 3 doz. \$16.00
Parlor Queen 3 doz. \$24.00
Standard 3 doz. \$24.00
Supreme 3 doz. \$22.00
Sweeping Carpet Sweeper Co. make the following rebates:
\$1.00 3 doz. in 5-doz. lots.
\$2.00 3 doz. in 10-doz. lots.

Lawn—

Thompson Mfg. Co. 30¢

Swings—

Davies Lawn 25¢

Tacks, Brads, &c.—

List Oct. 19, '89, Old Established straight Weights. Short Weight goods are sold at lower prices.
Carpet Tacks:
American, Blued 47 1/2¢
American, Tin'd and Cop'd 52 1/2¢
Steel, Bright and Blued 47 1/2¢
Steel, Tinned and Coppered 52 1/2¢
Swedes Iron, S. S. Blued 40¢
Swedes Iron, S. S. Tinned 47 1/2¢
American Iron Tacks, Domestic 37 1/2¢
American Iron Tacks, Foreign 50¢
S. S. Blued 37 1/2¢
S. S. Tinned 45¢
Lanc. Blued 30¢
Lanc. Tinned 37 1/2¢
Upholsterers' S. S. 47 1/2¢
Upholsterers' Lanc. 37 1/2¢
Gimp Tacks:
S. S. Blued 30¢
S. S. Tinned 42 1/2¢
Lanc. Blued 20¢
Lanc. Tinned 35¢
Basket and Trimmers' Tacks:
Lanc. 20¢
S. S. 30¢
Hungarian Nails 35¢
Common and Patent Brads 35¢
Leathered Tacks 5¢
Brush Tacks and Nails, S. S. 20¢
Looking Glass Tacks, S. S. 20¢
Picture Frame Points, S. S. 12 1/2¢
Lace Tacks Blued 20¢
Lace Tacks, Tinned 20¢
Finishing Nails 52 1/2¢
Trunk and Clout Nails:
Black 52 1/2¢
Tinned or Coppered 57 1/2¢
Basket Nails 37 1/2¢
Chair Nails 30¢
Cigar Box Nails 30¢
Tin Capped Nails 50¢
Shoe Finders' List, Apr. 14, '94:
F. H. Cobblers' Nails:
4 1/2-Sin. and shorter, 100 lb \$20.60
5 1/2-Sin. and longer, 100 lb \$18.85
C. Corrugated Brass Nails or Flat Head Improved Brass Nails:
No. 18 & 19 17¢& heavier
2-8 & 2 1/2-Sin. \$60.00 \$41.20
3-8 & 3 1/2-Sin. 51.50 35.15
4-8 & longer 41.20 33.45

Miscellaneous—

Double Point 85&10&85&10&10
Wire Carpet Nails 60&10&80&10&10
Bill Nye Brad Box 4.00
Bonnie Blue 3 box \$1.50
Claw Handle Carpet 3 gr. \$4.00
Home Tacks, 30¢; No. 100, 3 case (12 cartons), \$72.00
Home Nails, No. 200, 3 case (12 cartons), \$30.00; No. 400, 3 case (12 cartons), \$60.00
Parisian Gilt Nails, carton 50¢
Plymouth Rock Carpet Tacks 20¢
Upholsterers' Nails 50&10

Wire Brads and Nails—

Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10&10

Tanks, Oil—

Emerald, S. S. & Co. 30-gal. \$8.70; 60-gal. \$11 each 50&10&5

Tapes, Measuring—

American 40&10&50¢
Chesterman's, Regular list 30¢&30¢
Excelsior, Special list 20¢
Spring 40¢

Thermometers—

Tin Case 80&80&10

Thimble Skeins—
See Skeins.

Ties, Bale—Steel.

Standard Wire, list 50&10&5

Tinnerns' Shears, &c.—
See Shears, Tinnerns', &c.

Tinware—

Stamped, Japanned and Piced, list Jan. 20, '87 70&10&70&25

Tire Benders, Upsetters, &c.—See Benders and Upsetters, Tire.

Tobacco Cutters—
See Cutters, Tobacco.

Tools—Coopers'—

Albertson Mfg. Co. 25¢
Barton's 20¢&20¢
Beatty's 33 1/2¢
Bradley's 20¢
Sandusky Tool Co. 30¢&30¢
Shaves, Cincinnati Tool Co. 20¢
L. & J. White 20&5

Lumber—

Cant Hooks, "Blue Line" 3 doz. \$16.00
Cant Hooks, Common Finish 3 doz. \$12.00
Cant Hooks, Mail. Socket Clasp, "Blue Line" Finish 16.00
Cant Hooks, Mail. Socket Clasp, Common Finish 14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish 14.00
Cant Hooks, Clip Clasp, Common Finish 12.00
Hand Spikes, 6 ft., 15.00; 8 ft., \$20.00
Pike Poles, Pike and Hook, 3 doz. 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50
Pike Poles, Blue Line, 3 doz. 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00
Pike Poles, not ironed, 3 doz. 12 ft., \$6.00; 14 ft., \$7.00; 16 ft., \$9.00; 18 ft., \$12.00; 20 ft., \$16.00
Mail. Iron Socket Peavies, 3 doz. \$19.00
Eagle Brand, "Blue Line" 3 doz. \$20.00
Rin Peavies, Common 3 doz. \$18.00
Steel Socket Peavies 3 doz. \$21.00
Setting Poles, 3 doz. 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00
Swamp Hooks 3 doz. \$18.00
Champion Steel Socket Peavies 3 doz. \$18.00

Maple Handles, 2 1/2 in. x 4 1/2

to 6 ft. \$24.00

Maple Handles, 2 1/2 in. x 4 1/2 to 6 ft. 26 50

Maple Hndls, 3 in. x 4 1/2 to 6 ft. 29 00

Champion Solid or Split Socket Peavies, 3 doz. \$21.00

Maple Handles, 2 1/2 in. x 4 1/2 to 6 ft. \$21.00

Maple Handles, 2 1/2 in. x 4 1/2 to 6 ft. 23 50

Maple Hndls, 3 in. x 4 1/2 to 6 ft. 26 00

Champion Cant Hooks, with steel 25

Maple Handles, 2 1/2 in. x 4 1/2 or 5 ft. \$20.00

Maple Handles, 2 1/2 in. x 4 1/2 or 5 ft. 21 50

Maple Handles, 3 in. x 4 1/2 to 5 ft. 23 50

Champion H. Hooks, with 25

Maple Handles, 2 1/2 in. x 4 1/2 to 5 ft. 17 50

Maple Handles, 2 1/2 in. x 4 1/2 to 5 ft. 10 50

Champion Lug Hooks 28 00

Champion Skidding Tongs 72 00

Champion Swamp Hooks 22 00

Champion Pike Poles, ironed complete, 12 to 20 ft. 45¢

Cant Hook and Peavy Handles 45¢

Saw—

Atkins, new list 40¢
Simonds' 33 1/2¢

Transom Lifters—
See Lifters, Transom.

Traps—Game—

Blake's Patent 50&10&60¢
Newhouse 40&10&50&5
Oneida Pattern 75¢&75¢&10&5
Sensible 33 1/2¢

Mouse and Rat—

Cyclone 3 gr. \$5.25&5.75
Dandy 3 doz. \$1.75
French Traps (Genuine), No. 1, Rat, 3 doz. \$15.00; No. 3, Rat, \$7.25; No. 4, Mouse, \$4.75; No. 5, Mouse, \$3.75
Hotchkiss Metallic Mouse, 5-hole traps, 3 doz. 65¢; in full cases, 3 doz. 60¢
Hotchkiss Imp. Rat Killer, 3 gr. \$12.50
Hotchkiss New Rat Killer, 3 gr. \$12.50
Ideal 3 gr. \$9.00
Mouse, Bonanza, 3 doz. \$0.90&1.00
Mouse, Cage, Wire, 3 doz. \$2.50
Mouse, Catch-em-alive, 3 doz. \$2.50, 15¢

Mouse, Wood, Choker, 3 doz. holes 9@10¢
Mouse, Round Wire, 3 doz. \$1.50 10¢
Mouse, Sensible 33 1/2¢
Rat, Decoy, 3 gr. \$10.00 33 1/2¢
Rat, Sensible 33 1/2¢
Schuyler's Rat Killer, 3 gr. \$15.00
Waddell's Go Bang, 3 gr. \$12.50

Fly—

Balloon, Globe or Acme 3 doz. \$1.50; 3 gr. \$13.50
Harper, Champion or Paragon 3 doz. \$1.75; 3 gr. \$16.50

Trimmers—
Butter and Cheese 25¢

Trimmers, Spoke—

Bonney's No. 1, 3 doz. \$5.00; No. 2, \$7.00 40¢&40¢
Ives', No. 1, \$15.00; No. 2, \$12.00 40¢
Stearns' 55¢&10¢
Toughs', 3 doz. \$9.00 20¢&10¢
Cincinnati 25¢&10¢

Trowels—

Brade's Brick 25¢&25¢
Maynard's 25¢&10¢
William's Brick and Plastering 25¢&25¢
William Johnson 25¢&25¢
Peace's Plastering 25¢&25¢
Rose's Brick 25¢&30¢
Worral's Brick and Plastering 20¢
Cleves' Angle Trowel, 3 gr. No. 1, \$36.00; No. 2, \$30.00; No. 3, \$15.00 net 10¢
Garden 70¢

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list 40¢
Barnes' Barrel Trucks 40¢
Daisy Stove Trucks, Improved pattern, 40¢
Thompson Mfg. Co. 40¢

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine BC. B.
No. 9, 1/2 and 3/4 lb Balls 22¢ 20¢
No. 12, 1/2 and 3/4 lb Balls 18¢ 24¢
No. 18, 1/2 and 3/4 lb Balls 17¢ 30¢
No. 24, 1/2 and 3/4 lb Balls 17¢ 20¢
No. 36, 1/2 and 3/4 lb Balls 16¢ 19¢
Chalk Line, Cotton, 3 lb Balls 17¢
Cotton Mops, 6, 9, 12 and 15 lb to doz. 15¢&17¢
Cotton Wrapping, 5 Balls to lb 13¢&14¢
2-Ply Hemp, 1/2 and 3/4 lb Balls (Spring Twine) 10¢&10¢
3-Ply Hemp, 1 lb Balls 10¢&10¢
3-Ply Hemp, 1 1/2 lb Balls 10¢
2, 3, 4 and 5-Ply Jute, 1/2 lb Balls 8¢
Mason Line Linen, 1/2 lb Balls 54¢
No. 204 Mattress, 1/2 and 3/4 lb Balls 52¢&54¢
Paper 5¢&6¢
Wool 5¢&6¢

Vises—

Solid Box 50&10&60¢

Parallel—

Backus and Union 40¢
Bonney's 45¢&50¢
Double Screw Leg 15¢&10¢
Fisher & Norris Double Screw 15¢&10¢
Hollands' 40¢&40¢
Howard's 40¢
Massey Quick Action 20¢&25¢
McGrills' 40¢
Millers Falls 40¢&40¢
Moore's 20¢
Parker's 20¢&25¢
Prentiss 20¢&25¢
Sargent's 70&10&70&10&10
Stimpson's Adjustable 40¢
Stephens' 25¢&30¢
Trenton 40&5&40&10

Saw Filers—

Bonney's, Nos. 2 & 3, \$15.00 45¢&50¢
Cincinnati 25¢&10¢
Economy, 3 doz. Nos. 110, \$10.00; 120, \$15.00 50&10&10&5
Hopkins', 3 doz. \$17.50 40¢&10¢
Reading 40¢&10¢
Stearns' Common, Nos. 0, 1, 2 & 3 50¢
Stearns' Rubber Jaw, Nos. 10 & 33 33 1/2¢
Wentworth 20¢&10¢

Miscellaneous—

Bauer's Pipe Vises 10¢
Cowell Hand Vises 20¢
Enterprise Pipe Vises, each \$5.00 40¢
Massey Combination Pipe Vise 40¢
Phoenix Vises 33 1/2¢
Phoenix Hand Vises, 3 doz. \$3.00 33 1/2¢

Wads.—Price Per M.

U. M. C. & W. R. A.—B. E., 11 up. 60¢
U. M. C. & W. R. A.—B. E., 9 & 10. 70¢
U. M. C. & W. R. A.—B. E., 8. 80¢
U. M. C. & W. R. A.—B. E., 7. 90¢
U. M. C. & W. R. A.—P. E., 11 up \$1.00
U. M. C. & W. R. A.—P. E., 9 & 10 1.25
U. M. C. & W. R. A.—P. E., 8 1.50
U. M. C. & W. R. A.—P. E., 7 1.50
Eley's B. E., 11 and larger \$1.70&1.75
Eley's P. E., 12 to 20 \$3.00&3.

Standard Fiber—	
Per Doz.	Decorated.
Cuspidors.....	\$7.50
Half-Peck Measure.....	\$3.00
Peck Measure.....	3.50
Keelers, 1 1/2 in.....	3.00
Keelers, "Daisy," 8 in.....	4.00
Spittoons No. 2, 3 doz.....	\$4.80
Wash-Basins, 10 1/2 in.....	1.80
Wash-Basins, 12 in.....	2.00
See also <i>Pails</i> .	

Indurated Fiber—	
Per Doz.	Decorated.
Basins, Ringed, 1/2 doz., No. 2.....	1.80
Butter Bowls, 15, 17 and 19-inch (3 pieces), 1/2 nest.....	\$1.50
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), 1/2 nest.....	\$2.55
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), 1/2 set.....	\$1.20
Spittoons No. 2, 3 doz.....	\$4.80
Washtubs Nested, Nos. 0, 1, 2, and 3 (4 pieces), 1/2 nest.....	\$5.75
See also <i>Pails</i> .	

Silver Plated Hollow—	
4 mo., or 5¢ cash in 30 days.	
Meriden Britannia Co.....	40&5%
Reed & Barton.....	40&5%

Whips—	
American Whip Co. Length.	4 1/2 5 5 1/2 6 6 1/2 7 7 1/2 8 ft.
I. X. L., Whalebone Driving.....	\$18.00 20.00 22.00 24.00 27.00 30.00 33.00 36.00
Eureka, Two-thirds Whalebone.....	15.00 16.50 18.00 20.00
Bull Bone, Half-Pgth Whalebone.....	11.00 12.00 13.00 15.00
American Standard.....	8.00 8.50 9.50 10.50 12.00 13.50 15.00 16.50
True Grip, Raw Hide Center.....	6.00 6.00 6.50 7.00 7.50 8.00
New Name, Stocked Java, Black and Wine Colors.....	6.00
Americus, 93 Pen Whip.....	6.00
Gents' Light Driving No. 111.....	6.00
Gents' Light Driving No. 108.....	5.00
Hand-Made Stocked Java No. 103.....	3.75 4.00
A large variety of cheaper grades.....	50¢@\$.00
Team Whips.....	\$2.00@7.50
Toy Whips.....	gr. \$2.50@12.00
Hardware Assortment, 10 American, 75 Whips for \$50.	

Rogers & Brother.....	40&5%
Simpson, Hall, Miller & Co.....	40&5%
Hartford Silver Plate Co.....	40&5%
William Rogers Mfg. Co.....	40&5%

Washers—	
Size hole.....	5-16 3/4 1/2 5/8 to 1 1/4
Washers.....	\$4.80 3.30 2.55 2.30
In lots less than 200 lb., 1/2 lb., add 1/4¢, 5-lb boxes 1 1/2 to list.	

Washer Cutters—	
See <i>Cutters, Washer</i> .	

Water Coolers—	
See <i>Coolers, Water</i> .	

Wedges—	
Iron.....	1/2 lb 2 1/2 @ 2 1/2¢
Steel.....	1/2 lb 3 @ 3 1/4¢

Weights, Sash—	
Ton lots at factory.....	\$14.00@15.00
Small lots at factory.....	\$15.00@16.00

Well Buckets, Galvanized—	
See <i>Pails, Galvanized</i> .	

Wheels, Well—	
8-in., \$2.00; 10-in., \$2.50; 12-in., \$2.75	

Wire and Wire Goods—

Market:	
Br. # Ann., Nos. 0 to 18.....	75¢@80¢
Cop'd, Nos. 0 to 18.....	75¢@75¢10&5%
Galv., Nos. 0 to 18.....	70¢@75¢
Tin'd, Tin'd list, Nos. 0 to 18.....	75¢@75¢10&5%
Stone, Br. and Ann'd:	
Nos. 16 to 18.....	82 1/2%
Nos. 19 to 26.....	82 1/2%
Nos. 27 to 36.....	82 1/2%
Ann'd Wire on Spools.....	80%
Brass, list April 9, '94.....	40&5%
Cast Steel Wire.....	50%
Copper, list Jan. 18, '84.....	40&5%
Galvanized Fence.....	75¢@10%
Tate's Spooled, Top and Brass.....	50&5%
Malin's Brass & Cop. on Spools.....	50&5%
Steel Music Wire, 12 to 30, imported.....	60¢@70¢ 1/2 lb
Stubs' Steel Wire.....	\$8.00 to 2, 30¢
Tate's Spooled, Tin'd & Ann'd.....	60&5%
Tinned Broom Wire, 18 to 21, 1/2 lb.....	43¢
Wire Clothes Line, see <i>Lines</i> .	
Wire Picture Cord, see <i>Cord</i> .	

Bright Wire Goods—

Standard list.....	90¢@90&15%
Wire Cloth and Netting—	
Galvanized Wire Netting, 80@80&10&5%	
Painted Screen Cloth, 100 ft. \$1.40@1.45	

Wire, Barb—See *Trade Report*.Wire Rope—See *Rope, Wire*.

Wrenches—

American Adjustable.....	40@40&10%
Baxter's.....	60¢@60&10%
Coe's.....	50&5%
Coe's "Mechanics".....	50&10&3@60%
Girard Standard.....	65&10@70%
Lamson & Sessions' Engineers'.....	60&10%

Lamson & Sessions' Standard.....70&10%

Girard Agricultural.....	75&10&10
Lamson & Sessions' Agric'l.....	@80&5%
P. S. & W. Agricultural.....	
W. & B. Diamond.....	50@50&10%

Acme, Bright.....	40@40&5
Acme, Nickelled.....	\$2.50@2.60
Alken's Pocket (Bright).....	80&10%
Alligator.....	35¢@10@40&5%
Always Ready.....	
Bemis & Call's.....	35&5%

Adjustable S.....	30&10%
Brigg's Pattern.....	40&10%
Combination Black.....	40&10%
Combination Bright.....	40&5%
Cylinder or Gas Pipe.....	45&5%
Extra Heavy.....	45%
Merrick's Pattern.....	55%
No. 3 Pipe, Bright.....	55%
Bit Wrench, Adj., Tatum's.....	25¢@25
doz. \$2.25.....	25&10%

Cincinnati Brace Wrenches.....	30@30&5%
Diamond Steel.....	25&10%
Donohue's Engineer.....	50&10%
Eagle.....	70@70&10%
Hercules.....	55&10&3%
Taft's Vise Wrench.....	25&10%
Tatum's Brace.....	40@40&5%
The Favorite Pocket, 1/2 doz. \$4.....	55&3%
Walker's.....	25%

Webster's Pat. Combination.....	25%
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Wringers, Clothes—

In lots of less than one dozen.....	
Am. Wringer Co., list July 2, '94, 2¢	
Colby Wringer Co., list May 1, '94, 2¢	
Lovell Mfg. Co., list July 2, '94, 2¢	
Peerless Mfg. Co., list Feb., '92, 2¢	
National Wringer & Mfg. Co., list June 1, '92.....	2¢

Wrought Goods—

Staples, Hooks, &c., list March 17, '92.....	85&25@90%
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PAINTS, OILS AND COLORS. Wholesale Prices.

White Lead, Zinc, &c.

Lead, Eng., B.B. white.....	5 1/2 @ 5 1/2
Lead, Amn. White:	
Dry.....	4 @ 4 1/4
In Oil.....	5 1/2 @ 5 1/2
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	1 @ 1/2
Lead, White, in oil, 12 1/2 lb tin	
pails, add to keg price.....	1 @ 1/2
Lead, White in oil, 1 to 5 lb as-	
sorted tins, add to keg price.....	2 1/2 @ 2 1/2
Zinc, American, dry.....	3 1/2 @ 4 1/2
Zinc, French, Red Seal.....	3 1/2 @ 4 1/2
Zinc, French, Green Seal.....	3 1/2 @ 4 1/2
Zinc, French, V. M. X.....	6 @ 7
Zinc, Antwerp, Red Seal.....	6 @ 6 1/2
Zinc, Antwerp, Green Seal.....	6 1/2 @ 7 1/2
Zinc, German, L. Z. O.....	5 @ 5
Zinc, V. M. in Poppy Oil, G. Seal,	
lots of 1 ton and over.....	10 1/2 @ 10 1/2
lots less than 1 ton.....	11 @ 11
Zinc, V. M. in Poppy Oil, Red Seal,	
lots of 1 ton and over.....	9 1/2 @ 9 1/2
lots of less than 1 ton.....	10 1/2 @ 10 1/2
Discounts—French Zinc—Discounts to	
buyers of 10 bbl. lots of one or assorted	
grades, 1¢; 25 bbls., 2¢; 50 bbls., 4¢. No	
discount allowed on less than bbl. lots.	

Dry Colors.

Blue, Celestial.....	1/2 lb 6 @ 8
Blue, Chinese.....	40 @ 50
Blue, Prussian.....	25 @ 40
Blue, Ultramarine.....	8 @ 25
Brown, Spanish.....	1/2 lb 1 @ 1
Brown, Vandyke, Amer.....	3 @ 3 1/2
Brown, Vandyke, English.....	6 @ 8
Carmine, No. 40, in bulk.....	\$2.00 @ 2.10
Carmine, No. 40, in box or bbls.....	2.10 @ 2.20
Carmine, No. 40, in ounce bot.....	3.00 @ 3.10
Green, Paris, in bulk.....	23 @ 23 1/2
Green, Paris, 170 @ 175 lb kegs.....	23 @ 23 1/2
Green, Paris, small pack.....	25 @ 25 1/2
REBATES—3¢ @ 10 on lots of 10,000 lb or	
over; 2¢ @ 10 on lots of 5,000 lb; 1¢ @ 10	
on 500 to 1000 lb purchased during the season	
Green, Chrome, ordinary.....	6 @ 12
Green, Chrome, pure.....	22 @ 25
Lead, Red, bbls. and 1/2 bbls.....	4 1/2 @ 5

Lead, Red, kegs.....	5 @ 5 1/2
Litharge, kegs.....	4 1/2 @ 4 1/2
Litharge, bbls. and 1/2 bbls.....	5 @ 5
Ocher, Rochelle.....	1 1/2 @ 1 1/2
Ocher, French Washed.....	1 1/2 @ 1 1/2
Ocher, German Washed.....	1 1/2 @ 1 1/2
Ocher, American.....	1 1/2 @ 1 1/2
Orange Mineral, English.....	7 1/2 @ 8
Orange Mineral, French.....	10 @ 10 1/2
Orange Mineral, German.....	7 1/2 @ 8
Orange Mineral, American.....	7 1/2 @ 8
Red, Indian, English.....	5 @ 15
Red, Indian, American.....	2 @ 5
Red, Turkey.....	9 @ 14
Red, Tuscan.....	7 @ 10
Red, Venetian, Amer.....	100 lb 70 @ 100
Red, Venetian, English.....	100 lb 110 @ 135
Sienna, Italian, Burnt and	
Powd.....	1/2 lb 4 @ 5
Sienna, Ital., Burnt, Lump.....	1 1/2 @ 3 1/2
Sienna, Ital., Raw, Powd.....	4 @ 5 1/2
Sienna, Ital., Raw, Lump.....	1 1/2 @ 3 1/2
Sienna, American, Raw.....	1 1/2 @ 1 1/2
Sienna, American, Burnt and	
Powdered.....	1 1/2 @ 1 1/2
Talc, French.....	1 1/2 @ 1 1/2
Talc, American.....	1 @ 1 1/2
Terra Alba, French, 100 lb.....	65 @ 75
Terra Alba, English.....	65 @ 75
Terra Alba, American No. 1.....	65 @ 75
Terra Alba, American No. 2.....	45 @ 50
Umber, Turkey, Bnt. Lu.....	2 1/2 @ 3 1/2
Umber, Turkey, Raw & Powd.....	2 1/2 @ 3 1/2
Umber, Turkey, Raw, Lump.....	2 1/2 @ 3 1/2
Umber, Turkey, Bnt. Amer.....	1 1/2 @ 1 1/2
Umber, Turkey, Raw, Amer.....	1 1/2 @ 1 1/2
Yellow, Chrome.....	10 @ 25
Vermilion, American Lead.....	11 @ 12
Vermilion Quicksilver, bulk.....	58 @ 59
Vermilion Quicksilver, bags.....	63 @ 65
Vermilion, English, Import.....	60 @ 65
Vermilion, Imitation Eng.....	8 @ 30
Vermilion, Trieste.....	90 @ 95
Vermilion, Chinese.....	85 @ 100

Paints in Oil.

Black, Drop, Frankfort.....	25 @ 30
Black, Drop, English.....	12 @ 15

Black, Drop, Domestic.....	7 @ 10
Black, Lampblack, Best.....	20 @ 35
Black, Lampblack, Common.....	7 @ 13
Black, Ivory.....	8 @ 15
Blue, Chinese.....	35 @ 40
Blue, Prussian.....	20 @ 45
Blue, Ultramarine.....	12 @ 18
Brown, Vandyke.....	7 @ 12
Green, Chrome.....	8 @ 13
Green, Paris.....	16 @ 18 1/2
Sienna, Burnt.....	7 @ 14
Umber, Raw.....	7 @ 10
Umber, Burnt.....	7 @ 10

Miscellaneous.

Barytes, Foreign, 1/2 ton.....	\$22.00@24.00
Barytes, Amer. floated.....	20.00@32.00
Barytes, Amer. No. 1.....	16.00@18.00
Barytes, Amer. No. 2.....	13.00@15.00
Barytes, Amer. No. 3.....	11.00@12.00
Chalk, in bulk.....	1 ton 1.75 @ 2.00
Chalk, in bbls.....	100 lb 1.40 @ 1.50
Clay, English.....	1 ton 13.00 @ 18.00
Cobalt, Oxide.....	100 lb 1.45 @ 1.85
Whiting, Common.....	100 lb .40 @ .45
Whiting, Gilders.....	.50 @ .55

Putty.

In barrels and 1/2 bbls.....	13¢ @ 13¢
In tubs.....	15¢ @ 15¢
In tin cans.....	15¢ @ 2¢
In bladders.....	15¢ @ 2¢

Spirits Turpentine.

In regular bbls.....	@ 28 1/2
In machine bbls.....	@ 29

Glue.

Low Grade.....	1/2 lb 7 @ 9
Cabinet.....	11 @ 13
Medium White.....	12 @ 14
Extra White.....	16 @ 20
French.....	10 @ 22
Irish.....	10 @ 12 1/2

Animal and Vegetable Oils

Linseed, City, Raw.....	1 gal. 56 @ 57
Linseed, City, boiled.....	59 @ 60
Linseed, Western, raw.....	54 @ 55
Lard, City, Extra Winter.....	57 @ 58

Lard, City, Prime.....	56 @ 57
Lard, City, Extra No. 1.....	43 @ 45
Lard, City, No. 1.....	43 @ 45
Lard, Western, prime.....	58 @ 57
Cotton-seed, Crude, prime.....	25 @ 26
Cotton-seed, Crude, off grades.....	@ 24
Cotton-seed, Summer Yellow,	
prime.....	31 @ 32
Cotton-seed, Summer Yellow,	
off grades.....	28 @ 29
Sperm, Crude.....	57 @ 58
Sperm, Natural Spring.....	55 @ 56
Sperm, Bleached Spring.....	60 @ 61
Sperm, Natural Winter.....	62 @ 63
Sperm, Bleached Winter.....	67 @ 68
Whale, Crude.....	32 @ 33
Whale, Natural Winter.....	41 @ 42
Whale, Bleached Winter.....	43 @ 44
Whale, Extra Bleached.....	46 @ 47
Sea Elephant, Bl'ched Winter.....	48 @ 50
Menhaden, Crude, Sound.....	22 @ 23
Menhaden, Crude, Southern.....	25 @ 26
Menhaden, Light Pressed.....	25 @ 26
Menhaden, Bleached Winter.....	32 @ 34
Menhaden, Extra Bleached.....	35 @ 36
Tallow, City, prime.....	51 @ 52
Tallow, Western, prime.....	50 @ 51
Cocanut, Ceylon.....	5 1/2 @ 5 1/2
Cocanut, Cochín.....	6 @ 6 1/2
Cod, Domestic.....	28 @ 30
Cod, Foreign.....	30 @ 32
Red Elaine.....	35 @ 38
Red Saponified.....	1/2 lb 43¢ @ 44
Bank.....	gal. 24 @ 25
Straits.....	25 @ 26
Olive, Italian, bbls.....	58 @ 58
Neatsfoot, prime.....	60 @ 62
Palm, prime, Lagos.....	1/2 lb 5 @ 5 1/4

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold	
test.....	1 gal. 63¢ @ 7 1/4
Black, 29 gravity, 15 cold test.....	7 @ 8
Black summer.....	5 1/2 @ 6 1/2
Cylinder, light filtered.....	10 @ 15
Cylinder, dark filtered.....	10 @ 15
Paraffine, 23 1/2 @ 24 gravity.....	11 @ 12
Paraffine, 25 gravity.....	9 1/2 @ 10 1/2
Paraffine, 28 gravity.....	7 1/2 @ 7 3/4
Paraffine, red.....	9 1/2 @ 10 1/2

THE IRON AGE.

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